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The Peace Palace Designs at the Hague.

WE very much doubt whether the Peace Palace at the Hague will ever really be built, and we feel quite sure that if it is built on the plot of land at present proposed, at a turn of the Old Road to Scheveningen and practically outside the town, it will be a failure, if not a laughing-stock. To propose that at the Hague, the city *par excellence* of long vistas of water and trees, a building which is intended to be a kind of European centre of reference and arbitration, should be built outside the town and away from its political centre, on a side plot facing nothing and with nothing to lead up to it, is absurd both in an architectural and an official sense. If it is so placed it will be a failure, as the Imperial Institute here has been a failure, from being relegated to a site too far removed from the Government centre, and it will be in an architectural sense completely misplaced and wasted, as there will be no point from which the building could be properly seen, and no axis of approach connected with it. A building on such a scale and with such a purpose ought to be a central object at the end of a dignified approach on its axial line, the more so in a city which, as observed, is full of straight vistas. If it were not for the old building called the Gevangen-poort, which is of historical and archæological value, we should have said, get possession of the house property at the west end of the Vyver, the large rectangular piece of water along the south of which stands the old palace of the Binnenhof; at the end of this the Peace Palace would stand splendidly, reflected in the water, and in the midst of the historic centre of the town. But the Gevangen-poort, though not right on the bank of the Vyver, is too close to it to allow much space for building between it and the water, and we admit that to demolish this bit of ancient building would be a vandalism; but it is to be regretted, for the site would otherwise have been an ideal one for the Peace Palace, in an architectural sense at all events. If it is argued that the Peace Palace has no special relation to the Government of the Hague, and therefore need not be connected with its official centre (which is perhaps true), why could not possession be obtained of part of the large open space called Alexander's Veld (which seems to be a kind of parade ground), on the north side of the town, and the Palace be built there on the axis of Park-straat and Alexander-straat (running north and south) and of the most important public monument, the National Monument of Dutch Independence (1813), which stands centrally in the open space between the two streets? The building would then at least occupy a position of monumental dignity, with an important axial approach to it. To erect such a building on a corner plot at the turn of a road would be nothing less than an absurd anti-climax to the competition. And, to return to our first idea about the Vyver site, it would be perfectly possible, after getting rid of the unimportant houses at the west end of this piece of water, to extend the ground by building a concrete pier at the west end of the Vyver, which would only cut off a comparatively small part of this large piece of water, and would form a perfectly ideal site for the Peace Palace, at the end of a broad vista of water in which it would be reflected, and in the neighbourhood of the most historic buildings of the town. Surely that is worth thinking of. It would be likely to be a success there; it will not be so if placed where it is at present proposed to place it.

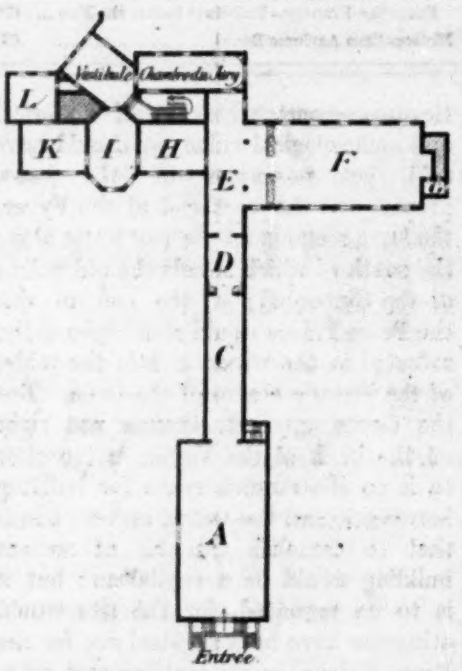
The building was to contain two separate sections; A, the Court-House Section; B, the Library Section. The latter was to be built so as to form a separate part of the Peace Palace, with its own separate entrances from the Park, but to have an interior communication with the Court-House on the principal floor. The Court-House Section, which would form the principal and front portion of the building, was to contain two courts, a larger and a smaller one, and a Council Room in connexion with each court, each Council Room to have its own separate exit to the Park, unless the two were close together, in which case one exit and one set of retiring rooms would serve for both. The upper story was to contain, as its principal apartment, a room for the "Conseil Administratif" of

the Permanent Court of Arbitration; some of the competitors have however placed this Permanent Council Room on the principal floor. With this department there were of course to be various secretaries' rooms, rooms for clerks, messengers, etc. The Library Department was to contain a large storage library for books, two reading-rooms, librarians' rooms, a room for geographical maps, a cataloguing room, etc.; and to this it was added that on the upper story there must be room for the Board of Directors of the Carnegie Foundation; but in this case, as in that of the Permanent Council Room, some of the competitors have included it in the principal floor.

In regard to the arrangement of the plan, therefore, it will be seen that the most important point of distinction between different plans would be in regard to the manner in which the two main portions were related to each other architecturally and on plan; whether they should be treated as two separate blocks of building with merely a corridor of communication, or whether the whole should be combined into one architectural design, only with an internal separation in plan. In regard to the Court section also, as there were two courts to be provided, but one of them larger than the other, it would be a question whether the accesses to the two courts should be made similar and symmetrical, only making one of them smaller internally than the other; or whether the larger court should be given a more important and central position and the smaller one relegated to a side or angle position. There is something to be said for either principle. A good many of the competitors, we observed, have taken a very illogical way of reconciling symmetry of approach with difference of size in the courts, by simply making one court smaller than the other by cutting off portions of the interior for accessory rooms in connexion with the court, which, if they were required in one court, were required in the other.

The designs, 221 in number, are arranged mostly on the ground floor, and also in six rooms on the upper floor, of a rambling old palace entered from The Paleis Straat, the first block of which looks like a brick church, but appears really to have been some kind of assembly-room or banqueting-hall, with an open timber roof. The plan of the ground floor rooms occupied by the drawings is given in the accompanying cut, the upstairs rooms occupied being those over K, I, H, E and D. Room A is the open-timber roof one just mentioned. F is a rather fine-looking room in classical style, with a row of columns down each side, grained to imitate marble, carrying an entablature from which springs a segmental-arch coffered ceiling, leaving narrow aisles between the colonnade and the windows, ceiled in square coffered compartments. The staircase is a poor affair as far as the stairs are concerned, though there is an ill-judged attempt at architectural effect at the top, where there is an open clearstory colonnade formed by pretty substantial-looking columns which stand on the outer edge of a large overhanging cove cornice, with very singular effect;

What should be the style of a Peace Palace in which all the civilised nations of the world are supposed to be equally concerned? In view of its being a Peace Palace, one would say that the expression of repose should above all things be sought for; and in view of its supposed universality of interest (which it is to be feared is more imaginary than real), we should say that it ought to take one of those classic forms of architecture which, since the Renaissance, may be said to belong to no single country but to be the property of the civilised world. M. Cordonnier, to whose design (No. 213—motto "S'G,") the first prize of 12,000 guilders has been awarded, apparently thinks otherwise; and we gather from the published Report of the Jury that he considered that as the Hague has been chosen as the permanent seat of the Court of Arbitration, "the building should in style follow the local traditions of XVIth century architecture." As the architects' own reports are not attached to their designs, we can only gather the intention of each, at second hand, from the brief remarks in the Jurors' Report. If this design is supposed to represent local XVIth century tradition, it is that tradition as seen through French spectacles. The



Plan of Exhibition Galleries.

design reminds one very much of a Paris Mairie of the more exuberant type of detail, with a tower added at each end. The centre of the front, in the ground story, shows the three large round-headed doorways which are almost a religious observance in a French Mairie of the approved type. Above these there is a row of large mullioned windows in pairs, divided by piers with terminal figures, each couple of windows being again divided by a wall space with a decorative niche. These windows light the Permanent Council Room in the centre, and the secretaries' rooms and ante-rooms at each end; but these receive just the same fenestration design as the Permanent Council Room, whereas the latter ought certainly to have been emphasised in the exterior design. The centre block terminates with the usual expanse of high-pitched slated roof with a flèche in the middle, also like the orthodox type of Mairie. The towers, carried to a great height, are fearfully restless and cut up in detail, in the upper portion especially. Anything less suggestive of a "Peace Palace" it would be difficult to imagine; there is no repose anywhere; the whole thing is *dinquant*, though most elaborately and beautifully drawn in every part; and as far as the architecture is concerned we should regard its erection as the representation of the Peace Palace as an absolute misfortune. It is different with the plan; the plan is an admirable one, and we should have supposed that it was to this that the author owed his position in the competition, but for the fact that the Jurors speak rather coldly of it, implying that it emphasises too much the distinction between the two departments of the building, connecting them only by one corridor on the axis line; and we gather that the selection of this design for the first premium was mainly due to its adoption of local architectural traditions. If so, we can only conclude that they are doubly in the wrong; first, in selecting a design for such a building on grounds of local tradition; secondly, in accepting this as local tradition: it is only local tradition Frenchified—very much Frenchified. In regard to the plan, M. Cordonnier treats the plan in two longitudinal blocks,* connected, as before observed, by a single short corridor on the vertical axis of the plan. The store library is in the centre of the Library block, the public entrance at one end of it, and the administrative entrance at the other end. In the front block the entrance-doors give access to a large vestibule running nearly across the front, the two courts placed symmetrically one at each end of it. The internal difference of size between the courts is made by cutting off from the right-hand court, as an ante-room, the amount of space occupied in the other court by the bench. This is a clumsy contrivance, for, as has already been suggested, if an ante-room is wanted in the one court it is wanted in the other. But it is the only fault we see in the plan, unless it is considered a mistake to treat the two departments as separate architectural blocks; the Jurors appear to have thought so, but there is much to be said for either view in this respect. The drawings, which occupy the whole of Room D to themselves, are no doubt a splendid set, and do M. Cordonnier in one sense the greatest credit; we can only regret that we cannot feel more sympathy with the result in an architectural sense.

The other five premiated designs are all on the right side of Room C as one goes from Room A.† The design to which the second premium is awarded (No. 194; "Pax"), by M. Marcel, of Paris, is shown in a magnificent set of drawings, incomparably the finest set exhibited, and which one can hardly speak of

* We are using "longitudinal," throughout this article, to mean blocks or corridors parallel with the line of the principal front, and "vertical" to mean those which are at right angles to it.

† The letter B is assigned to the gallery at one end of A, reached by the staircase in the corner; but none of the designs put up there are of any consequence.

without enthusiasm. It is "Ecole des Beaux-Arts" *in excelsis*, as well in its merits as in its defects, and is a typical example of French draughtsmanship and design in its most monumental aspect. In spite of having given this design the second premium, the Jury Report dismisses it coolly enough, with the remark that "it is only the plan that has at all commended itself," and that "both in the plan and the elevation the lines of the composition notably depart from the noble simplicity which should characterise a building devoted to the serious and dignified purposes of the Peace Palace." It should seem therefore that they have discovered this "noble simplicity" in the first premiated design, in which we can only say that their ideas of "noble simplicity" in architecture must be very different from ours. But why, after this criticism, did they give this design the second place? Were they so human as to be seduced by the mere drawing? There is certainly a good deal of exuberance in the design, but taken altogether it is much finer and more scholarly work than the First Premiated design. The outlines of the plan tend to run rather into curved lines; in other words, it is very much "modelled" in plan as well as in elevation; but we do not know that it is the worse for that. The entrance-hall is on a plan with a segmental curve at front and back, and a smaller semicircular curve at each side, with massive piers at the meeting of the curves. To the left of this is the small court, to the right the grand staircase. The large court occupies (vertically) the central axis of the plan, the council-room connected with it being an oval apartment adjoining the upper end of the court, one-half of it forming a projecting bay on the further margin of the Court House block. Beyond this is a formal garden round which the Library department is built, the book-store making a separate longitudinal block beyond this, and connected with it (or disconnected from it) by two corridors of communication. This is the principal practical defect of the plan, as the book-store is removed to far too great a distance from the reading-rooms to be convenient. The corridors round the Library court or garden are connected on each side with the corridor of the Court block by an open columned vestibule of three bays which would make a good architectural feature; indeed, the whole plan is full of possibilities of interior effect. The architectural treatment of the principal front is a good deal suggested by that of the Petit Palais, including the employment of a large semicircular *fronton* over the central entrance; but the dome is much larger, and consists of a steel-framed dome showing externally, and a built dome underneath it. The design is certainly, as already observed, very exuberant, but there is great force and vigour in it, and the detail is at all events much better than that of the First Premiated design.

The third premium, for the design No.132—"Concordiâ Parvæ Res Crescunt: Discordiâ Maximæ Dilabuntur"—goes to a German architect, Herr F. Wendt, of Charlottenburg, for a design which is as intensely German as the other two are French; German in its solid dignity, and also in a certain clumsiness and heaviness of character—qualities both recognised in the Jury Report. The plan, with a large octagonal central hall reached through a vestibule running across the front between the wings, is well laid out for internal effect, but somewhat scattered for practical working. The Library section forms a three-armed block at the upper side of the site, connected only at one point with the main block. The architectural treatment is a sober and rather ponderous classic, with a large Corinthian order and strong cornice carried all round the principal block of building. The ends of the principal front are brought out as boldly projecting wings, the recessed portion being occupied in almost its entire width by what would be a hexastyle portico only that the columns nearest the centre are doubled, and the centre intercolumniation much wider than the others, marking the approach to the great central doorway. Over the cornice is a plain heavy-panelled attic surmounted by statues; and over the octagon hall a dome raised on a high circular drum very plainly treated; the dome is panelled in gores in the orthodox manner, and has a large eye at the top, surrounded by what can only be called a *wall*, which makes one of the heaviest and ugliest finishes imaginable. There is not a touch of fancy or originality in the whole thing; it is absolutely academic architecture, and not of the most fascinating kind as such; and yet we cannot but think that it fulfils the architectural ideal of a Peace Palace better than either of the two already named, because it has at all events repose and dignity, and is cosmopolitan rather than local in character and associations.

From the prose of Herr Wendt we pass to the poetry of Herr O. Wagner, of Vienna (No. 17—"L'Art de l'Epoque"), who receives the fourth premium for a design which also may be said to be neither local nor national in style, since it certainly does not represent the recognised architecture of any special time or place. From the Report we learn that "in the written memorandum which accompanies this design the author explains that a Palace of Peace, being something new, seems to him to require novel methods of artistic treatment." We should be more inclined to say that a Palace of Peace merited the repose which arises from traditional treatment; an architect who proposes a new style for it surely is of those who "come not to send peace but a sword"; yet we agree with the Jurors that "the result is interesting and not without originality," indeed we should say that it has a great deal of originality, though we do not see exactly how it illustrates "L'Art de l'Epoque." His plan shows an immense square forecourt with a columned cloister on each side returned across the front to the central gateway. The columns, however, do not carry an entablature and roof, but only treillage and twining plants. Up the centre of the forecourt is a broad straight drive, at the end of which a monumental column with a statue of Peace stands in front of the entrance to the building. The two Council Chambers occupy the positions at each end of the front block; the two courts are vertical on the plan, with an ante-room separating them from the council chambers. The side cloisters on each side of the forecourt lead up on each side to a small columned terrace which forms the outer vestibule to the courts. Beyond the ends of the courts a wide gallery runs across the whole building, on the further side of which the grand staircase is projected as an apse. From either end of this wide gallery run corridors connecting the Court block with the Library block; the book-store is across the top of the plan. The communication galleries, however, lead only to what is called a "pièce de reserve" in the Library plan, which would apparently have to become a passage-room on occasion, so that this part of the corridor connexion is rather clumsily managed. The architectural style is difficult to describe. The impression conveyed is that the exterior is intended to be revêted with marble slabs, or slabs of some kind; there are practically no mouldings, except a shallow and wide-spreading cornice with modillions. The windows are square-headed with visible steel lintels, or what look like such. Before the main entrance there is no covered portico, but four columns which carry gilt winged figures. Below the cornice is a series of gilt festoons and a row of the coloured armorial shields of all nations; above the cornice is a blocking with a square pedestal over each pier, carrying a seated gilt statue. The pavilions at each end of the main front, though projecting slightly on plan, are lower than the centre portion and roofed with segmental gilt domes, behind which, a little further, rises on each side a stepped erection reminding one of the outlines of buildings in Assyrian bas-reliefs, carrying two tiers of gilt angels blowing trumpets, and on the apex a gilt figure seated in an archaic chair, flanked by a gilt lion at each side; the figure presumably represents Justice, as this portion of the exterior is immediately over the entrance to the courts. Altogether, it is a strange architectural idea, unlike anything we have seen before; but it is not ugly, and it must be added that the whole thing is harmonious and in keeping, and there is nothing unpractical about it, in spite of its singular appearance.

The fifth premium goes to an American firm (No. 79, with a geometrical device as motto), Messrs. Greenley & Olin, of New York. This, the most quiet and unpretentious of the six premiated designs, is in regard to architectural expression the most refined and most suitable of all, only it is to architectural appearance a one-story building, whereas the Instructions contemplate a two-story one (in addition to the Basement): On the side elevation there are two stories of windows shown, between the columns of the order; the front is entirely a one-story treatment. An order of Ionic pilasters carries an entablature and cornice; the large windows between the pilasters are crowned with a secondary cornice which stops against the pilasters, the spaces between that and the main entablature being occupied by panels filled with decorative design. This wing design is stopped by a higher projecting

block of building in the centre, from which again projects a columned portico with a pediment over and a large deep-set arched portal beneath it; the architrave of the portico order ranges with the cornice of the order on the wings. The centre block is crowned, *more Americano*, with a low stone dome. The whole is most refined and scholarly in treatment, and groups admirably. The Jury Report objects somewhat captiously to what they call "the round ends of the principal façade," which they say injure the effect; they are not "round ends," they are apses projected from the square end, which is quite a different matter. We do not wonder that a jury which gave the first premium to M. Cordonnier's restless design should speak rather coldly of this; but it is a much better and purer style of architecture. The plan has a great deal of merit. The entrance is into a square hall under the dome, the two courts opening right and left, each ending in that apse which the Jury do not like, but which is quite suitable for this position; the entrances to the two courts are symmetrical as seen from the hall, but the smaller court is reduced by being reached through a short corridor with minor rooms on each side of it. The two departments form one building, the corridor communication running completely round, only interrupted by shutting-off doors between the Court and the Library departments. All the provisions as to special entrances are carried out. The book-store of the Library department occupies a considerable part of the centre of the plan, backing up against the wall of the grand staircase of the Court department. The provision for the side-lighting of the book-store between the bookshelves is cleverly provided for, so as to be as effective and occupy as little wall space as possible. The plan is very compact and covers less ground than the other premiated designs; and altogether this is a most meritorious design and had a right to a higher place in the awards.

The sixth premium is awarded to the design (No. 130—"Eirene") of Herr F. Schwecten, of Berlin. The plan is rather naive and square-cut, and in spite of the strict symmetry of the exterior the plan is not symmetrical at all, and the corridor plan contains two or three "dead ends," always the mark of inferior planning. In fact the plan is manifestly inferior to any others of the six, and far inferior to that by Mr. Hare which we published in our issue of June 2. That a design like this should have received a premium and that by Mr. Hare have been left out of consideration does not say much for the judgment of the Jury. The fact is that the Jury were five Continental architects to one American and one Englishman, and Continental taste in architecture is radically different from English, which is too sober to suit Continental judges; and we are very much inclined to think that the winners of the two first premiums owed their position as much to the striking character and size and number of their drawings as to more important considerations. Herr Schwecten's design is not unpleasing, but it is weak in points; there is a boldly projected central tetra-style portico with a Roman Doric order and a sculptured pediment, in the centre of a block of building pierced with separate windows in the Italian style, which *ordonnance* is simply carried round the corner at each end, with nothing to strengthen the angle or to make any balance to the central portico; and this weakness at the angle is the more noticeable because this part of the building is finished with a visible sloping roof with no balustrade, which makes a receding hip line at the angle. The portico and the wings, in fact do not seem to belong to each other. The square central hall has a double walling, the outer walls carrying a square mass of blocking rising above the roofs and decorated by panelling and angle finials, the inner walls carrying a circular dome of graceful design in itself, but which is badly and clumsily connected with the structure immediately below it.

In another article we will notice some of the best of the non-premiated designs.

NOTES.

The Regent-street Quadrant.

No sooner has Mr. Norman Shaw's grand design for Regent's Quadrant become public property, than the bootmakers and drapers and their compeers are up in arms to try to prevent the erection of a design which will deprive them of their beloved plate glass fronts, and give London at least one street of monumental design. We do not believe that their objections will have any effect; but it is impossible to pass without comment the preposterous idea that the improvement of London street architecture is to be stopped because tradesmen imagine it to be necessary that the whole front of their shops should be one sheet of plate glass. If it were of any use to argue with selfishness and stupidity, one might point out to them that a fine class of architecture in shops may turn out eventually, if they could only understand it, to be a better advertisement than the ruining of all architectural character by mounting buildings on sheets of plate glass. But no such considerations can be expected to reach the shopkeeping intellect. It was the shopkeepers of the Strand, it may be remembered, who did all they could, some years ago, to pull down the church of St. Mary-le-Strand, and who would have gladly seen the destruction of a fine architectural monument in order that there might be more room for carriages to draw up at their shops. If they had been listened to, what would people be thinking of the transaction now? This is an agitation on just the same lines; an attempt to stop a great architectural improvement because it does not suit the ideas of shopkeepers. We hope the authorities will remain firm, and let these people see that "trade interests" are not to rule everything.

London Railway Bills.

RESIDENTS in the northern half of London have reason to be satisfied with the decision of two Parliamentary Committees in favour of the North-East London and the North-West London railways. The former of these undertakings will provide a much-needed line of communication, partly underground and partly in the open, along the main road to the north as far as Waltham Abbey. The latter will furnish similar facilities between Victoria and Cricklewood, with the great advantage of stations for the transfer of traffic to and from the systems of the Metropolitan, London and North-Western, Central London, Brompton Piccadilly and Great Northern, London Brighton and South Coast, and South-Eastern and Chatham railways. These exchange stations will be established at Victoria, Hyde Park Corner, the Marble Arch, Chapel-street, and probably at Edgware-road, and we fully agree with the opinion expressed by Sir Douglas Fox that the scheme, as amended by the extension to Victoria, promises the most valuable north and south connexion not already authorised which could be proposed for the metropolis.

Workmen's Compensation.

AN important point has been decided by the Court of Appeal in the case of Lowe *v.* Myers & Son. They have decided that a "claim" under the Workmen's Compensation Act need not be in writing. This is an important point, as under the new Bill the change in the language, although it would seem to imply that the claim should be made in writing, since it speaks of its "delivery," is not so explicit in its terms as to overrule the above decision. The Departmental Committee advised that the claim should be made in writing, and it seems reasonable that the employer should be given this security; and since it has been decided by the House of Lords in Powell *v.* Main Colliery Company that the claim need not be formal in its form, it would seem that no hardship to the workman would ensue; although in view of the fact that the Bill is to embrace industrial diseases which may be some time in declaring themselves, possibly the present limit of time (six months) within which the claim must be made should be extended. It certainly seems very undesirable that employers should be rendered liable to have a verbal claim for compensation set up months after the accident, which possibly, if given at all, may have been made to some agent.

Victoria Station.

THE partial opening of the new station of the London Brighton and South Coast Railway will, no doubt, do something to relieve the congestion from which regular passengers have suffered for years past, largely in consequence of the fact that all main line and suburban trains were compelled to enter and leave the terminus on two tracks only, one for up and one for down traffic. The widening of Grosvenor Bridge and the provision of a fan-like extension of tracks outside the enlarged station will save many tedious delays, and the additional platform accommodation will make access far more easy. Until the work of reconstruction has been completed, in about two years' time, local trains will continue to use the west and main line trains the east of the terminus, an arrangement that will ultimately be reversed. One of the most striking features of the new station is the admirable

system of high-pressure incandescent gas-lighting, which is described on another page, and which has been found more satisfactory and more economical than the arc-lighting previously employed. Some difficulties and annoying delays were experienced during the early part of the week owing to the unsatisfactory behaviour of the electrical signalling apparatus, which appears to have been affected by the stiffness of the new points. This, however, was a purely temporary trouble, which has now been practically overcome.

Automobilism.

THE *Times* of last Saturday, under this heading, published a Reuter telegram containing an account of the Herkomer motor race. The telegram contained this passage:—"The only accident reported happened to a Berlin car, which ran over and killed a peasant near Melk. The weather was fine but the roads were heavy. The cars will remain here on exhibition to-morrow." A lady took part in the race, and the telegram also speaks of the ovation she received. The extraordinary callousness of motorists as to the lives and safety of others is now a matter of common knowledge, but surely such an account of a fatal accident as this, even in a telegram, is unjustifiable. If the man killed had been a dog or a chicken hardly less could have been made of his death. What would be thought of an account at a cricket match where an onlooker was killed by a ball and his death announced in such terms? Moreover, what would become of cricket if such occurrences were frequent? This breach of decency and humanity serves one good object, and therefore we do not regret its appearance in the Press: it shows the real attitude of the motorist, when he is not on his guard affecting studied moderation to safeguard the enjoyment of his sport.

A Concrete-steel Failure in America.

THE collapse of a concrete-steel building during construction in Atlantic City, N.J., should serve to emphasise the extreme importance of sound design and workmanship in all cases where the new material is employed. The failure to which we refer shows clearly that these essentials were lacking to a lamentable extent. An engineer who has examined the ruins reports that the surfaces of the fallen beams and columns were badly split and broken, and the concrete was so much affected by frost that large portions could be broken off and crushed by a slight effort of the hand. Another circumstance, for which no excuse can be made, was that no satisfactory bond existed between the concrete of the beams and the floor slabs. That the necessity for such union had not been recognised by the contractor was evidenced by the fact that in several instances the beams were formed of trap concrete, while the slabs were of concrete with limestone aggregate. As the designer has evidently included the thickness of the floor slab in the effective depth of the beams, the lack of cohesion between the two classes of members necessarily involved a serious departure from the calculated resistance of the construction, and might in itself be sufficient to account for the failure. Another defect was demonstrated by the shearing of two beams at the supports, indicating that the reinforcement had not been carried to the points of bearing. Faults such as these may easily occur in reinforced concrete work, even when properly designed, if executed by inexperienced contractors under inefficient superintendence, and the lessons conveyed by this failure are so obvious that comment is unnecessary.

The Palace, Southwell.

THE Bishoprics Act of 1878 made provision for reforming the "peculiar" of Southwell, and an Order in Council, of February 2, 1884, revived and set up the present independent See For the uses of the new diocese the bishop suffragan of Nottingham bought the remains of the old palace, together with its gardens and part of the park—some 4½ acres in all. The palace, standing about 100 ft. distant, southwards, from the Minster, was formerly a residence of the Archbishops of York, and had been a favourite home of Cardinal Wolsey. It was originally built by John Kempe, Archbishop of York, 1424-52, and was completed by his successors, William Booth and other prelates. It formed a large quadrangular edifice, having a chapel, and on the north side a fine banquet-hall of *temp.* Henry VI. It will be replaced with the new buildings now being erected after Mr. W. B. Carõe's designs for the Bishop of Southwell. The association of Southwell, with the See of York, the most ancient in England, begins with the history of Mercia. Paulinus, consecrated archbishop in A.D. 627, founded at Finga Ceaster, in the Trent valley, one of the earliest Christian churches in those parts, which afterwards became the collegiate church of St. Mary, Southwell. The site lay in the midst of the Marches, which Pendha, having slain in battle Eadwin and Oswald, Kings of Deira, established as the kingdom of Mercia. Archbishops Thomas, Grey, Romaine, and Kempe rebuilt and enlarged the church in the course of the XIIth-XVth centuries; they possessed four parks within a radius of 5 miles, at Norwood, Little Park, Hockerwood, and Hexgrave.

Messrs. Waring & Gillow's New Premises.

THE new building that Messrs. Waring & Gillow have built for themselves in Oxford-street, from the designs of Mr. Frank Atkinson, their architect, was open to the public on Monday. Apart from the interest attaching to the commercial enterprise displayed in the size and completeness of the undertaking, an interest attaches to the building itself. The pernicious expanse of plate glass is in evidence on the ground floor, though the piers of granite are heavier than those which generally mask the steel stanchions carrying the superstructure. Fortunately the ground floor is the only floor marred in this respect. It is the unbroken stretch of plate glass windows, such as the Regent-street shopkeepers are now agitating for, which is such a blight on the appearance and character of our towns; if the large firms and respectable shopkeepers would set their faces against this unsightliness improvements could gradually be made—improvements which Messrs. Waring & Gillow's building faintly suggests; or we might get back to the dainty shop fronts of the Georgian period. The new block of buildings is on a fine plan, with a central Rotunda having galleries around it on each floor; there are eight floors, and some idea of the size of the building is gained from the fact that these floors provide about 8 acres of floor space for showrooms. Some of the showrooms are treated in a fine architectural manner, their proportion and design very effectively set off by the fine examples of antique furniture, pictures and hangings; they have ceilings very richly moulded and carved or cast in wood and plaster. Many other showrooms were fitted up as complete flats, showing ranges of furniture at different costs, while there are separate departments for each branch of household requisites.

The Pastel Society.

THE eighth exhibition of the Pastel Society is open at the gallery of the Royal Institute of Painters in Piccadilly. It is on the whole a better exhibition than last year, partly because it is not so disfigured with some of the ugly and scarcely decent figure scrawls by one or two French artists which were to be seen last year. Pictures at a Pastel exhibition may mostly be divided, as in this case, into two classes—works which illustrate what can best be done in pastel, and works in which the endeavour is made to simulate the effect of paintings in oil or water-colour. The latter are a mistake, as they only serve to show the limitations of the material. Among those who understand what Pastel is meant for is Miss Marion Gemmell, whose portraits in a free line treatment (Nos. 1, 2, 3, and 119) are very good. In landscape Pastel will do to indicate broad effects of light and colour and composition, as in Mr. Baldry's "Storm Clouds" (20) and "At the Edge of the Marsh" (21), but it does not do to carry landscape too much into detail in this material. Among the very best things are M. Le Gout-Gérard's four marine and shipping scenes, 101 to 104, the first-named especially. Chevalier Formilli treats effectively "The Harbour, Capri," and "The Field of the Angelus, Barbizon" (139, 140). Mr. Melton Fisher's "The Poem" (175), among the more highly finished works, is a very pretty figure of a girl reading, though a little too much of an imitation of painting. In the opposite class of work, Mr. Clausen illustrates very well the use of Pastel for rapid sketches of effect (178 to 182), especially in the two sketches "The Rickyard" and "A Willow Tree." Mr. Tuke has made a charming nude study, "Early Morning" (167), which may have been a study for a picture he is exhibiting at the New Gallery, or may be a replica of it in another medium. M. Legrand and Mr. Charles Conder supply the element of vulgarity in figure subjects which unfortunately is seldom absent from an exhibition of sketches and studies; the figure by the latter artist of a low and odious-looking woman listening at "The Keyhole" (77) is a remarkable example of the taste for the ugly and repulsive which is unfortunately so prevalent nowadays with some artists,

and which seems only to arouse the sympathy of the "art critics" of the day. As a contrast we may draw attention to Mr. Bruckman's beautiful little composition, "An Idyll" (147), which, except that the figures are clothed in everyday dress, reminds one of the feeling and style of some of Fantin-Latour's monochrome studies in combination of figures and landscape.

The Goupil Gallery.

THE summer exhibition of the Goupil Gallery includes one or two first-rate examples of the art of Mauve (3 and 11), and a fine picture by Herr Israels, "The End of the Day" (15), a dark undulating moor with the western light beyond, across which two weary peasants trudge. Mr. Robert Fowler's "The Rainbow, Conway" (31), is an effect, no doubt, but it hardly makes us forget the paint-pot—perhaps it is not intended to do so. Mr. Weiss's "February on the Seine" (38) is a good landscape; and there is a little Corot sketch (8) with a white house in the middle distance, and a fine sky by J. Maris in the picture called "Entrance to a River" (7). Among the black-and-white works in the outer room some sketches by Mr. Paul Henry, especially "The Top of the Hill," are worth note; and there are architectural subjects by Mr. Hanslip Fletcher and Mr. John Fulleylove. Among the small sculpture works by Herr Aronsen are some pretty ideal heads in marble, but his colossal head called "Beethoven" is one of several sculptural libels on the great composer which we have come across lately. It may be said that it is an ideal or symbolic head and not a portrait; but why represent Beethoven (as an English sculptor also did in last year's Academy) as a kind of inspired washerwoman?

The Leicester Galleries.

A COLLECTION of water-colours by Mr. Arthur Severn which occupies the principal room at the Leicester Galleries consists largely of studies of special and rather brilliant effects of light, which seen altogether give the exhibition rather a sensational appearance at first sight. Perhaps one or two of the effects are rather overdone, but in the main these drawings have the aspect of truth. "The Indian Ocean" (11), a dark cold sea beneath the last glow of sunset, is a fine work; also "Looking towards the Sierra Nevada from a P. and O. Steamer" (15). "Westminster by Moonlight" (4) is a real moonlight effect. Architecture is well treated in "The Salute, Venice" (34), and some other drawings. Of the landscapes, "Coast of Spain, near Gibraltar" (31), and "Lancaster Sands" (43), are among the best things in a very interesting collection. In the other room "Paintings of Dutch Life and Landscape," by Mr. and Mrs. Harold Knight, are very clever, the figure studies (which predominate) especially so. The two artists paint in a very similar style; the lady's work is distinguished by asterisks in the catalogue, otherwise it would be difficult to separate them by any distinction of style. Among the best are "Gossip" (1), in which the figure with the back to the spectator is remarkably expressive; "The Little Brother" (14); "Knitting the Stocking" (18); "The Mirror" (27); "The Baby's Cot" (28); and "The Window Curtains" (46). Mr. Gwelo Goodman's small "Water-colours in India," which occupy the front room, seem a little inspired, at least as far as the manner of putting in the figures is concerned, by the work of the late Mr. Melville. They are not important work, but they are good water-colour sketches. "The Taj" (32) is one of the best slight views we have seen of this often-painted building; and the drawings give a general impression of truth of colour.

The Fine Art Society.

AT the Fine Art Society there is a quadruple exhibition going on, of which however the portion contributed by Count Seckendorff, "At Home and Abroad," is the only one of artistic importance. Count Seckendorff's water-colours are well known at the Institute of Painters in Water-Colours, of which he is a member; they are characterised by freedom of style and effectiveness rather than by higher qualities of water-colour art, and a good many of the drawings now exhibited are of rather a topographical character; but he paints architectural groups well, and he is specially successful in some subjects of châteaux rising from among trees on a hilly site—see Nos. 21 and 34. "The Forum, Rome" (59), is a very good representation; and also the foreshortened Rialto in "Venice" (73), and the view of "Camogli" (84) with its tall narrow strips of houses, and the "Porto Venere" (90) with its mass of red-brick building on the opposite side of the canal. But the best thing in the collection is "An Old Oak Tree, Weidelsburg" (19), which seems to have been done under some special influence, as there is a higher style about it than in the others. The other three collections are a set of water-colours of "Veldt and Kopje in Five Colonies," by Miss Agnes Goodall, which are chiefly interesting in a topographical sense, and we imagine chiefly intended so, though they are good drawings; a series of chalk portraits drawn from life by Mr. C. E. Ritchie—good drawings, whether good likenesses we cannot judge; and Mr. George Roller's sketches under the title "Soldiering and Sport," which are hardly things for an art gallery.

Some Pictorial Decorations.

MESSRS. CARFAX & Co. have taken the large room of the Alpine Club for the arrangement of a series of decorative views in Italian cities by Mr. Kerr-Lawson, intended for panels in the drawing-room of a private mansion. They are arranged here much as they will be arranged in their ultimate position, each painting in an upright panel, the lower portion of which is occupied by a low-relief floral decoration in plaster, the picture occupying the upright space above. The paintings are kept in a low key of colour and treated with a certain severity of style which is proper to decorative painting, and we should think that in their position in the room they are intended for they will have a very good effect.

Illustrations of Egyptian Temples.

THE series of water-colour drawings and oil-pictures by Mr. Frederick F. Ogilvie, exhibited under this title at the Modern Gallery, do not quite answer to the title, as the fact is that the best things among them are the water-colour drawings of various old houses and picturesque corners in Cairo, which are excellent examples of architectural subjects treated in water-colour. The larger illustrations of the temples are less impressive than these, and do not seem to get all out of the subjects that might be got from them. The little view of a corner in the Hall of Columns of the temple of Isis at Philæ (46), with light coming in through the opening, is very good, as also is the larger drawing of "The Main Door of the Mosque of Sultan Hassan, before the Restorations" (64), an admirable piece of architectural illustration. The exhibition includes some special illustrations of the most recent discoveries at the temple of Mentuhetep III. at Der-el-Bahri (which seems to be the latest spelling adopted—we first knew it as "Deir-el-Bahari"), and of the Hathor cow image discovered by Mr. Naville, which are exhibited by the permission of the Egypt Exploration Fund.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Sir John Taylor presiding.

At a private meeting which preceded the resumed discussion on the London Traffic Commission Report, Mr. G. A. T. Middleton moved:—"That the Council be instructed to consider the practicability of including all architects practising in the United Kingdom within the scope of the Institute."

Mr. Cross seconded the motion, and it was carried.

The Annual Elections.

The results of the elections were announced. The Council and Standing Committees were declared duly elected as follows:—

The Council.—President—T. E. Collcutt. Vice-Presidents—J. S. Gibson, E. T. Hall, H. T. Hare, Leonard Stokes. Hon. Secretary—Alexander Graham, F.S.A. Members of Council—Reginald Blomfield, A.R.A., M.A.Oxon., F.S.A., J. J. Burnet, A.R.S.A. (Glasgow), W. D. Caröe, M.A.Cantab., F.S.A., A. W. S. Cross, M.A.Cantab., E. Guy Dawber, W. Flockhart, Ernest George (Past Vice-President), J. A. Gotch, F.S.A. (Kettering), E. A. Gruning (Past Vice-President), E. L. Lutyens, C. E. Mallows, E. W. Mountford, Ernest Newton, W. A. Pite, A. N. Prentice, G. H. Fellowes Prynne, J. Slater, B.A.Lond. (Past Vice-President), Paul Waterhouse, M.A.Oxon. Associate Members of Council—H. A. Crouch, W. A. Forsyth, S. K. Greenslade, H. V. Lanchester. Representatives of Allied Societies—H. Dare Bryan (Bristol Society of Architects), H. Sutton Chorley, M.A.Oxon. (Leeds and Yorkshire Architectural Society), E. Kirby (Liverpool Architectural Society), W. M. Mitchell, R.H.A. (Royal Institute of the Architects of Ireland), J. M. Monro (Glasgow Institute of Architects), Harbottle Reed (Devon and Exeter Architectural Society), H. O. Tarbolton (Edinburgh Architectural Association), H. H. Thomson (Leicester and Leicestershire Society of Architects), J. H. Woodhouse (Manchester Society of Architects). Representative of the Architectural Association (London)—R. S. Balfour.

Standing Committees:—Art.—Fellows: R. Blomfield, A.R.A., M.A.Oxon., F.S.A., W. D. Caröe, M.A.Cantab., F.S.A., E. Guy Dawber, E. George, J. S. Gibson, H. T. Hare, Professor W. R. Lethaby, Ernest Newton, E. S. Prior, M.A.Cantab., F.S.A., Paul Waterhouse, M.A.Oxon. Associates: J. Anderson, R. S. Balfour, A. T. Bolton, W. A. Forsyth, S. K. Greenslade, H. V. Lanchester.

Literature.—Fellows: Reginald Blomfield, A.R.A., M.A.Oxon., F.S.A., A. W. S. Cross, M.A.Cantab., Professor W. R. Lethaby.

E. S. Prior, M.A.Cantab., F.S.A., Halsey R. Ricardo, Professor F. M. Simpson, Professor B. Elsey Smith, R. Phenè Spiers, F.S.A., H. Stannus, A.R.C.A., Paul Waterhouse, M.A.Oxon. **Associates**: W. A. Forsyth, F. Lishman, W. H. Ward, M.A.Cantab., P. L. Waterhouse, M.A.Cantab., A. M. Watson, B.A.Lond., P. S. Worthington, M.A.Oxon.

Practice.—**Fellows**: W. H. Atkin Berry, H. Brodie, Max Clarke, G. Hubbard, F.S.A., J. D. Mathews, J. Murray, S. Perks, A. Saxon Snell, T. H. Watson, W. H. White. **Associates**: E. Greenop, E. R. Hewitt, H. Hardwicke Langston, T. E. Pryce, A. W. Tanner, R. Stark Wilkinson.

Science.—**Fellows**: T. W. Aldwinckle, Max Clarke, B. J. Dicksee, Matt Garbutt, F. Hooper, C. S. Peach, S. Perks, H. D. Searles-Wood, A. Saxon Snell, L. Solomon. **Associates**: R. J. Angel, H. W. Burrows, F.G.S., E. R. Hewitt, G. Pearson, A. W. Tanner, E. A. Young.

The Hon. **Auditors** are Messrs. Sydney Perks and William Arthur Webb.

New Members.

The following candidates for membership were elected to the various classes by show of hands under By-law 9:—

As Fellows:

C. H. Ashworth, Dublin.
T. Baird, jun., Glasgow.
A. Balfour, Glasgow.
R. Shekleton Balfour, London.
A. Black, Glasgow.
G. Bland, Harrogate.
P. Bown, Harrogate.
W. H. Brierley, F.S.A., York.
J. Dixon Butler, London.
J. A. Campbell, Glasgow.
H. E. Clifford, Glasgow.
J. McLean Crawford, Glasgow.
N. C. Duff, Glasgow.
W. N. Dunn, London.
W. A. Forsyth, London.
W. V. Gough, Bristol.
J. Hamilton, Glasgow.
W. C. Hardisty, Manchester.
F. G. Hicks, Dublin.
J. K. Hunter, Ayr, N.B.
A. Blomfield Jackson, London.
R. C. James, Bristol.
W. T. Jones, Durham.
H. V. Lanchester, London.
C. H. Löhr, London.
R. S. Lorimer, A.R.S.A., Edinburgh.
R. J. Macbeth, Inverness.
W. F. McGibbon, Glasgow.
H. P. Guérin Maule, London.
R. Miller, Glasgow.
E. A. Rickards, London.
F. W. Roberts, Taunton.
G. H. Sale, Derby.
R. D. Sandilands, Glasgow.
A. Skirving, Glasgow.
J. Thomson, Glasgow.
W. S. Wilson, Durban, Natal.
W. H. Wood, Newcastle-on-Tyne.
H. T. Wright, Newcastle-on-Tyne.

As Associates.

E. A. Agutter, Pietermaritzburg, Natal.
J. Barr, New South Wales.
A. F. Benjamin, London.
J. T. Wynyard Brooke, Manchester.

As Hon. Associate.

C. Harcourt Smith, LL.D., Keeper of Greek and Roman Antiquities at the British Museum.

As Hon. Corresponding Members.

J. Theodore John Cuypers, C.E., Amsterdam.
Hermann Muthesius, Berlin.

Traffic Facilities for London.

At the conclusion of the private business the discussion on Mr. Paul Waterhouse's paper, reported in the *Builder* of May 26, was resumed.

Professor Beresford Pite said that the paper which had been read was perhaps the most important that they as Londoners had had for many years. He ventured to think that new thoroughfares were of great importance to architects, and certainly to them more than to engineers. No doubt it was a matter which had attracted the attention of engineers, and had been dealt with in an engineering manner, but he suggested that it was primarily a matter of building. It was not merely a matter of through traffic. With regard to the matter on which the question had been brought before them, he would only refer in general terms to the extraordinary gift which Mr. Waterhouse possessed of providing that suggestive flavour of humour in his paper which characterised the work of the onion in the salad. Mr. Waterhouse had altogether adopted the directions of the roads proposed by the Traffic Commission, and he would start with the suggestion that the configuration of London was governed by the configuration of the river and the hills. He thought it would be useless to attempt to throw a new line of traffic communication through London irrespective of the weight of buildings adjacent to that line, and that weight of buildings was practically created by the line of the river, and therefore the wide new thoroughfare should be about equidistant from the river. Then with regard to the hills. There was Ludgate-hill, which was London, and there was Pentonville-hill, with the "Angel" on it, and then the general slope going westwards which lay between Piccadilly and the river. The suggested thoroughfares of the Traffic Commission neglected that configuration of the river, and practically neglected the configuration of London in vertical sections created by the hills. It passed up Pentonville-hill as if the traffic would like to get up it. Taking the great west and east road, they would notice that it terminated practically on the side of the park, and there was no logic in taking a huge thoroughfare to receive the greater part of London's traffic and throwing it upon the edge of Lancaster-gate. The only possible direction suggested by that line was, of course, the immersion of the traffic in the water in Kensington-gardens. Surely the western road ought to reach some focussing point. If it lead to the Marble Arch, it would receive relief in various directions, but leading as it did near the foot of Queen's-road, it seemed to be practically futile for its purpose, and Bayswater-road for at least a mile did exactly the work which it was proposed to be done by the west and east road. With regard to its general direction, it discarded the tendency of all the east and west roads on the north side of the river. If they noticed these roads they would see that they all converged on the City—that they all had practically a due easterly direction. The proposed road, however, had a north-easterly direction, and he could not imagine what section of the population would wish to hurry at electric tramway speed in a north-easterly direction, away from Oxford-street and the shops, and right away from the City to some point near St. Luke's. It seemed to him that the direction of the suggested road was contrary to the tendency of the traffic of London. If they looked to the road eastwards, the same truth applied, though his proposition with regard to the configuration of the river would appear to have had some bearing upon the eastern arm. All the easterly roads of London had a northern tendency, but the proposed great road from east to west would have the effect of driving the traffic from the east not to the City, but in the direction of Old-street and St. Luke's. In the same way, the north and south thoroughfare did not seem to him satisfactory, because it also neglected the tendency to the City. It created a wide road by the side of the great inclosure created by the railways on the north, but did nothing, and could not do anything, to receive and to relieve the north-western access to London. It was unfortunate, of course, that the railway-stations formed, as they did, a great wedge driven into London from the north and preventing freedom of access from the north-west into the centre, but this great north road did nothing but emphasise the existing difficulty, and only created an expensive thoroughfare. When they came southwards, the road in the same way avoided the City, and everyone who came down that road and wished to arrive at the heart of London would have to leave the road to itself and turn into some of the already existing thoroughfares. Generally speaking, the western districts of London at present had an ample number of good thoroughfares. If they took Oxford-street, they found parallel streets to relieve it to the north, such as Wigmore-street and the Euston-road. The Euston-road was a road created by Act of Parliament to be no less than 160 ft. wide, and the buildings were 50 ft. from the road, and it was a fact that when Marylebone Church was erected by Hardwicke it was found that the portico came over the line, and a special Act of Parliament had to be obtained to allow it to remain. But in the past Londoners had been very lax, and this road had become blocked by buildings at different points. It was to be hoped that when the leases fell in London would come into the reversion of the valuable inheritance of an east and west thoroughfare already existing. South of Oxford-street there were not the same facilities. Then they had to recognise the position of the Park. If they took the position of Hyde Park, they would find that the traffic of the north-west went on the north side of Hyde Park and the traffic on the south-west took the Piccadilly line. It would be obvious that any improvement of the means of access to London should follow the existing tendencies, and should rather take a similar direction to the great Oxford-street in the north and the Piccadilly line in the south. The scheme which had been proposed was very large and drastic. It was, he thought, too large to be possible, and one could imagine such a scheme only being carried out by the creation of an enormous trust to acquire a vast amount of property and hold it for a public improvement, and he hardly thought it was likely that such a trust would be brought into existence. As to Mr. Waterhouse's paper, if one rejoiced to hear of the Hotel Russell being under sentence of death, Mr. Waterhouse was absolutely impartial, because the Langham Hotel would also go. He expected that in his anxiety for All Souls' Church Mr. Waterhouse had forgotten that it had a back side as well as a portico, and that did not leave the delicious impression which his circular place had at first sight. Lastly, he would like to suggest that London possessed a very large number of beautiful buildings, and that if they had the chance of really clearing a space and taking the buildings they had in London and grouping them, there would be no capital in Europe which could compete. If, for instance, they took and grouped the Greek buildings they had in Bloomsbury—the British Museum, University College, St. Pancras Church, the entrance to Euston Station—or if they took the great City halls and grouped them, how wonderful they would be! Then they had a wonderful series of Gothic churches of the last half-century, and if these were put into a park, how nice they would be! He would really like to have all the Gothic reredoses of the last half-century put into South Kensington to give the public something to look at. Still, if they had the chance to arrange, what a fine city they could make of London, and he suggested that the proper method was to improve their line of access between these buildings. If they projected the line of Waterloo Bridge northwards, they came into the centre of the British Museum, and if the lines of new streets led to and from great buildings they would do something practical, and which would be more satisfactory to them as architects than the mere driving of a huge new thoroughfare right through the heart of London they knew and loved so well. Then, with regard to the configuration of the river, he would point out that the river was a sort of "S." The upper curve had St. Paul's sitting upon it, and it had for its centre Bethlehem Hospital on the south. The traffic of London was practically on that radius, because it crossed by several lines to the "Elephant and Castle." The lower curve had Westminster upon its shore and at its true centre, from which is struck Hyde Park-corner, and that was a part of London which wanted some relief, and probably the new Vauxhall Bridge would assist radiation from it. If they recognised that configuration it would help them to bring their buildings together. One point was probably the most important, as it was the most practical. Was it possible to have an authority in London which would with steady tradition and with architectural advice proceed to consistently harmonise their street widenings and street improvements so as to give them the means of obtaining relief when it could be done most cheaply and when most needed? They all wanted such a body as that. He ventured to think—and he said it quite prepared for criticism—that he thought they had that body in the London County Council. He could not help thinking that a body sitting with a permanent architectural staff, with the permanent supervision of public buildings, with statutory power with regard to the making of new roads, and with certain control over existing roads, was the body which ought to be strengthened and which ought to be supported, and which should work towards the attainment of the things which London most desired. He was quite sure that the improvement of the London County Council was very necessary, but he would suggest to the Institute that the improvement of the London County Council in architectural matters was wholly in their own hands, and if they were to take up a sympathetic attitude with the Council and seek to assist them on architectural matters in promoting new legislation, they

would be able to do much more good than by merely maintaining a critical attitude. In the last year the London County Council withdrew the greater part of a Bill which would have given them power to make streets up to 100 ft. in width throughout London, and to link together streets which wanted linking together, and which in many ways, and at a small expense, would have given relief to traffic. He ventured to warn them against the calling into existence of a Frankenstein monster without architectural tradition, and with regard to which they might have no control, to drive great boulevards through London and interfere with the existing architecture. He could not help thinking that there must be an improvement in the public in architecture before they ventured to call a new body into existence. He ventured to say that they, as architects, were not in a fit state of mind, or intellect, or art, to design buildings of such streets as were proposed. They did their best, but could produce nothing much better than Shaftesbury-avenue on a large scale, and he must say he was a little pessimistic as to Aldwych. It was the absence of real public interest in architecture which was to blame for this. However, if they were given another half a generation he thought they might be more fit for these new streets.

Mr. E. W. Hudson said that Mr. Waterhouse had on the whole dealt gently with the Royal Commission, but he had given them one telling hit when he referred to them as being tramway mad, and they would all agree with that. The disease had also been caught by the gentleman at the head of the Local Government Board. Mr. Waterhouse had not given them a comprehensive scheme, but had confined himself to offering an alternative line to the proposals put forward in a half-hearted way in the Report, and they would agree that the proposals of the reader of the paper were far more thoughtful. He, however, did not think that east to west or north to south thoroughfares were altogether what were required for London. His idea was that they did not require more such straight streets, but an elliptical line. The road might start from the east, take a curved direction, go over one bridge and pass along the south side of the river, and link up over another, as in some of the best-regulated Continental cities. He suggested that an elliptical line from Regent-street, passing north-east, then east, and then south-east again and over Tower Bridge through Bermondsey, and coming again over Westminster Bridge, would form one of the best elliptical lines which could be suggested. London lost its fortifications so early that it had not the advantage of pulling down the walls and filling up the ditch and of making a magnificent street, but that was what had occurred in Continental cities. The belt system was what he advised as the *ne plus ultra* for London. Looking at cities in America and in their own colonies they found they were all laid down on grid-iron lines, and belt lines were conspicuous by their absence. Besides the avenues in Continental cities there were also belt lines of railway. They had that in the Underground Railway in London, and what a benefit the despised railway had been! That had been copied in Paris. They did not want four lines of tramway anywhere, as had been foreshadowed. The motor-bus had not had a fair chance, and he believed that when improved it would be one of the great reliefs for the traffic of London. Objection had been raised to the newness of London's aspect if the schemes were carried out; but there was no objection surely to newness *per se*. They had seen the design for buildings along Regent-street, and, although the shopkeepers held up their hands in horror, they must admit that their architects could design something of which they might be proud. As to the Advisory Board, Mr. John Burns said one already existed at Spring-gardens, and in that he agreed with Professor Pite, who feared the creation of a new Frankenstein monster, but the public had already created one, and it was to that it was now proposed to grant extra duties. He thought the present duties of the London County Council were quite as much as they could properly carry out. Then it was proposed that there should be a new bridge to the west of Blackfriars. Could they imagine anything more dreadful than that? It would ruin the finest curve of the finest embankment the country possessed. It was perfectly unnecessary, for Blackfriars Bridge was to be widened, Waterloo Bridge could be widened, and by the addition of two wings to Charing Cross Bridge to carry carriage traffic they would be provided with all the accommodation that was necessary to relieve the Strand and Fleet-street. As to the width of roads, he considered it would be most extravagant to exceed 160 ft. Mr. Waterhouse suggested that it would be better to take the two frontages than only one, but it would be a much more expensive thing. Gray's-inn-road had only just been widened, and he did not think it would be agreed to widen that further. He felt that the fear of trespassing on the precincts of the Temple had been carried a little too far, and that if King's-bench-walk was thrown open it would form a splendid cut from the Strand to the Embankment, and so make Blackfriars Bridge more valuable. Then Mr. Waterhouse had been generous with the Duke of Devonshire in not desiring to interfere with his mansion, but he had not been so kind to the Duke of Bedford, and he (the speaker) suggested that in passing in front, instead of behind, the new St. Pancras Church he would do just as well, and, by widening Seymour-street, take away a lot of poor property and make a fine avenue leading to Camden Town.

Mr. W. Woodward said he could not follow Professor Beresford Pite's reference to the configuration of the Thames, and what that had to do with the traffic and the thoroughfares of London he could not imagine. There was a great deal in the learned Professor's speech he could not understand. With regard to the Euston-road, he knew the history of that thoroughfare, and spent a great deal of energy in preventing the Samaritan Hospital encroaching, of which he believed Professor Pite was the architect.

Professor Pite: No, I was not.

Mr. Woodward said that, dealing with the matter in a practical way, they must arrive at the conclusion that there was no possibility of getting new thoroughfares in London now. The present Government would not give them the money, and the London County Council had spent all the money it had, and they could not look forward to them to help them with new thoroughfares. What they must do to make the matter practical was to take advantage of the existing thoroughfares more than they did. If, for instance, the police would drive more of the traffic on to the Thames Embankment and do the same thing in Gower-street and relieve Tottenham-court-road and take advantage of the parallel roads, they would be able to get very considerable relief. He felt that the two lines suggested were quite as good for the relief of traffic as it was possible to design, and he was certainly not one of those who thought that if they got those thoroughfares there were no architects living who could design buildings for them. He felt that they could not adopt a better planning than that referred to in Regent-street, where they had blocks between streets and symmetrical, which was all they could expect, and it was far better than what they saw in Paris, Vienna, Brussels, and Buda-Pest. As regarded tramways, they knew it was proposed that they should run along the Embankment, and he thought they would simply spoil that thoroughfare. As to the width of thoroughfares, Mr. Waterhouse agreed that they should not be too wide, and they knew that Northumberland-avenue was 90 ft. wide, Portland-place 120 ft., and the new Piccadilly near the Circus was to be 80 ft. in width, building to building. Whatever they did in clearances he thought they should preserve as much as possible of old London. He was reading of the wonderful effect of Temple Bar, which now formed the entrance of Theobald's Park, and he hoped that Sir Aston Webb had preserved the beautiful piers which originally stood at Christ's Hospital. If they had to destroy thoroughfares the least they could do was to preserve some remains in a museum. With regard to a Board of Architectural Control, he would be very sorry to see such control resting at Spring-gardens. The London County Council officials had quite enough to do as it was. Professor Pite contradicted himself by first suggesting that the Board should be at Spring-gardens and then finding fault with Aldwych, which was the child of Spring-gardens. Reference had been made to the education of the public, and he would like to read them an extract from the *Times* by their art critic with regard to the designs of Mr. Norman Shaw for the new Regent-street Quadrant. The critic said:—"It might be made less heavy by abolishing the square blocks that are to interrupt the columns and by greater simplicity of detail generally. Let the architect beware of a recent shocking example—the new Palace of Justice in Rome. It has cost millions, and its decoration, because it is heavy and over-elaborate, is universally condemned. The stateliness of the new Quadrant would be improved, not diminished, if the distinguished architect would retrench a few of his details and simplify some of the lines." Well, he thought the buildings would make a magnificent addition to the architecture of London. It was lamentable that the art critic of the *Times* should not make suitable inquiry into the matter on which he wrote. If he had he would have found that the design was one of the most simple in lines and details that it was possible to have. There was certainly no elaboration, and it was a regrettable thing that such an influential journal should not take the trouble to ascertain the facts. He would only add, with regard to the opening of the Mall, that one of the suggestions made is that Institute thirty years ago was now being carried out by Sir Aston Webb. They could trust Sir Aston Webb to do what was right with regard to that, but there was an instance of the want of public spirit. The entry into the road could not be perfect unless Drummond's Bank was removed. It was to be retained, and it would prevent the widening of Whitehall, and they would spoil one of the finest things done in the early part of this century by not pulling down the bank.

Sir Aston Webb said he would not like the occasion to go by without adding his small congratulation, and especially to express the pleasure that he and they all had that one who bore so honoured a name in that Institute should have revived the interest which his father took, and should have read such an excellent paper before them. It was one of the most important subjects that they had ever had before the Institute. Architects, he thought, had spent a good deal of time in discussing the arts and crafts, and while they had been, if he might say so, fiddling over chairs and tables the greater interests of architecture had been apt to slip out of their fingers, and now they found that nearly all their municipal authorities had borough engineers or surveyors, and that the architects had little consideration given them. He thought that Mr. Waterhouse's paper and scheme showed how essential it was that when streets were laid out they should be laid out not only by engineers and surveyors, but in conjunction with architects, and that the very direction of the streets themselves were influenced in many cases by the architectural problems which arose. He was not concerned in saying whether these two streets were or were not on right lines. It was far too great a subject for him to enter into, and Mr. Waterhouse also protected himself by saying that he accepted the recommendations of the Commission as to these being the two best lines, and then he tried to put them into architectural form, and, so far as he (the speaker) was concerned, Mr. Waterhouse appeared to have succeeded. There was one thing he would like to say with reference to straight streets. Mr. Waterhouse was not much in favour of straight streets, but it all depended. At the first discussion Sir Melville Beachcroft gave them an amusing account of how Kingsway was made. They had been told that Mr. Frederick Harrison took up a ruler and drew a straight line upon the map. After all, that was quite right so far as it went, for a street like that ought to be straight. But it could not end there. They might have their straight streets without effect; the matter of importance was the manner they terminated the street. For instance, Harley-street and Wimpole-street had been constantly referred to. Both

streets were straight and wide, but they lacked dignity, and the reason for that was simply because they had no termination. Those streets ran into the Marylebone-road in a mean, poor way, and they had no architectural effect. That was a thing they constantly saw in parks. They perhaps saw a fine avenue leading up to a Georgian house, and the avenue appeared very fine indeed; but if they went into another park and saw a similar avenue, where the house had been removed, the avenue lost half its charm. In his opinion, the great thing in laying out streets was the termination. Mr. Woodward had referred to the Mall, and had urged that Drummond's Bank should be removed. If they stood in the Mall now and looked down towards the Palace they would see that there was a certain dignity. If they turned around and looked in the other direction there was the same road and trees, but a conglomeration of buildings at the end, which took all the effect out of the wide road. If, however, they pulled down Drummond's Bank they would only give a better advertisement to the Grand Hotel and other buildings, and they would not get that dignity which a wide thoroughfare of that kind required. Therefore it was that they were now in the course of erecting a building which would span right across the thoroughfare, and they would then get a wide road, with the Palace at one end and a great building at the other. Professor Pite had told them they would not be able to build on those sites for another half a generation, but it was probable that the sites would not be ready until that time. Then, no doubt, the profession would be ready. The Professor no doubt knew, for he had the young under his tuition, and therefore was speaking as an authority. He thanked Professor Pite for his kind proposal to fill South Kensington Museum with second-hand reredoses, but hoped it would not be carried out. He hardly knew whether the London County Council was the proper authority for great street schemes in London, and he was not sure that some arrangement of that sort with some outside advice attached, and with someone to whom they would be responsible, would not be a good thing. The great thing was that there should be somebody, whether an Imperial authority or a municipal body, who should be the recognised authority responsible for the alterations in their streets, and who should have some scheme. He would like to read to them an extract from a speech delivered by the Bishop of Birmingham, who had put the matter far better than he himself possibly could. The Bishop said: "Again we look through miles and miles of streets in our big cities without open spaces; with nothing except what Dickens called 'an uninterrupted view over the way'; and think of what that means—never to realise or breathe anything of the largeness which comes in open spaces. Then you see lands not built over, not in cultivation, and you ask 'Why?' 'Oh, because they are not ripe for development!' But we say they are ripe for development to-day. They have been ripe for development these years past for the good of the community. We want the whole mass of our cities to be organised, planned, and laid out. Instead of that, the cities grow at the will of the jerry-builder or the property owner—orderless, shapeless, without method, because there is no one to plan and forecast and give the city space and dignity and room and order; something which can make it worthy to be called a city."

Mr. Searles Wood moved:—"That this Council present a memorial to the Government urging that, as the Royal Commission on London Traffic reports it to be necessary to open up new thoroughfares and communications, it is most desirable, in order to preserve the architecture of London, that the profession of architecture should be either represented on that Board or that a professional advisor or advisors should be employed by the Board that will be formed to deal with the laying out of the new thoroughfares."

Mr. Slater seconded the motion, and said that the reason for the present congestion of traffic was that their forefathers had not provided foresight. The congested districts of to-day were the open spaces of a hundred years ago, and what were the open spaces of to-day would be the congested districts of a hundred years hence unless their municipal authorities looked to it and got powers to protect the public.

Mr. Waterhouse said that he would amplify his remarks for the *Journal*, but there was one thing he would like to say. It was suggested that they were attempting to raise a Frankenstein monster, but they were not raising anything at all. It was the Royal Commission who suggested that a Board should be appointed, and a Bill was actually before Parliament for the formation of the Board. Without wishing to appear to step forward in this matter as the creators of this monster, they might at least make their suggestion that the monster should be assisted by architectural advice.

The Chairman said the more they heard of the enormous work which had been proposed the more they felt themselves indebted to Mr. Waterhouse for having dealt with the subject, and he (the speaker) heartily concurred with many of the views he had expressed, and especially with reference to the utilisation of Kingsway. To create another road and not utilise that would be a great extravagance. He also agreed with the recommendation for the increase of bridge accommodation between north and south in front of the Law Courts. Much of the block which occurred was in the Strand and in Park-street, Westminster, and they were due solely to the want of more bridge accommodation. There was no such accommodation between Westminster and Waterloo Bridges, and what was the result? Thousands of vehicles crossed the existing bridges to get to Charing Cross. They came across Waterloo Bridge and came down the Strand to Charing Cross. If a bridge was across the Thames in a line with St. Martin's Church it would be of enormous service in stopping the congestion of traffic. A great deal might be done by the police in diverting traffic, but they seemed indisposed to be at variance with certain sections of the public. What did they find at Hyde Park Corner? The arch was set back to get rid of the block, but, notwithstanding, the 'busses continued to go straight along Piccadilly and straight by St. George's Hospital. If the police had forced them to go round the way made for them, the block would have been got rid of. The creation of a Traffic Board, he considered, would be a good thing if properly formed. Tramways, he thought, had been overdone, and he did not think the enormous schemes for railways to run out twenty or thirty miles round London were needed just now. There was no difficulty when they once got to the stations, but the difficulty was to get there.

It was announced that the next meeting would be held on June 23, when the Royal gold medal would be presented to Sir Alma-Tadema.

THE SILCHESTER EXCAVATIONS.

THE results of the excavations conducted by the Silchester Excavation Fund in 1905, now on view at the Society of Antiquaries, are this time chiefly remarkable for some objects of an architectonic character in stone. These are (*a*) a fragment of a column in white limestone about 9 in. in diameter and 2 ft. 6 in. high, with a beaded necking broken off, evidently part of a Doric column; (*b*) a "winged" altar in grey stone, about 2 ft. 6 in. high, roughly square on plan, with a projecting base, top, and two side lugs, or "wings," all worked out of the one stone: and (*c*) an unfinished couchant lion, also about 2 ft. 6 in. long, and in grey stone.

Neither the altar nor the lion exhibit any detail whatever, and show deep chisel-marks, but it can be readily understood that the excavators regard such objects as of much greater importance than the pottery, bones, and various small utensils and ornaments usually found on Roman sites, largely as the latter—and the pottery in particular—bulk at Silchester.

Of other finds, the pottery claims first attention. The most perfect examples were extracted from rubbish-pits discovered from their soft nature in the process of trenching. The results this year excel more in quality than quantity, and include some interesting examples of the British "New Forest" and "Caistor" wares, some complete vases of various shapes in grey clay, unglazed, and several more or less experimental techniques based on the "so-called" Samian ware found wherever Roman remains are known. There are some distinctly fine examples of this ware in the room, particularly some on the central table, exhibiting indented ornamental forms, with remarkably clean-cut edges and lustrous glaze.

Perhaps the most interesting pottery fragment of all is an attempt at polychrome design in a grey clay overlaying a red, with a lustrous black glaze, and a thick painted and knobbed decoration in white and orange. This is also on the central table, as are the mortars for pounding meat—flat libation-like bowls about 1 ft. in diameter with draining spouts. In the process of making these mortars had coarse sand thrown on to the surface of the clay when wet, so as to offer a hard, rough ground for the operation of the flint grinder. In process of time the sand got worn off.

The tray of painted plaster fragments, which formed wall-decoration, is an interesting exhibit. It is remarkable how similar all ancient paint was in technique, and what precise resemblance these particular fragments have, both in colour and design, to much earlier examples from South Europe.

There are also cases of silver and copper coins, small bronze and bone implements and ornaments, and animal and human bones, including some complete skeletons, but these call for no particular attention here. Notice should be taken, however, of the pane of glass in broken pieces, for all the world like a modern window-pane in cheap green glass.

The excavations are further illustrated by the large general plan hanging on the wall, some detailed plans of particular houses recently excavated, and some photographs.

The exhibition remains open till Tuesday, June 19, when the finds follow the former ones to the Reading Museum.

MAGAZINES AND REVIEWS.

UNDER the head "Some Pressing Questions of the Public Service" the *Burlington Magazine* considers, among other points, the future of the National Gallery and the Tate Gallery under the management of their possible directors. The appointments are now made, and we have much more faith in the appointment to the National Gallery than in that to the Tate Gallery, which we cannot regard as safe in the hands of an art-critic who has shown such a decided leaning towards eccentric and temporary aberrations in modern painting. In regard to the National Gallery we entirely agree that the present policy of its Director ought to be "to make certain of preserving for England the few supreme masterpieces which still remain in our private collections." Mr. Robert Ross's article on "The Place of William Blake in English Art" seems rather to amount to the conclusion that William Blake was himself simply, and had no "place," having in fact neither predecessor nor follower; and if that is what is intended, we entirely agree. Blake will never appeal to any but a minority; those who can enter into the extraordinarily imaginative spirit of his designs and his poetry (which at its best is almost as remarkable as his design) will feel that he is not to be classed with anyone else in art, or to be coldly criticised for his faults in technique; you must take him on his own ground of spiritual insight or leave him alone altogether. The attitude of the average citizen towards Blake will always be that which we once heard expressed before the picture of "The Spiritual Figure of Pitt Guiding Behemoth"—"No, upon my word, that is coming it a little too strong!" We think that some of Blake's admirers have done him some harm with the cold outer world by accepting too enthusiastically every strange fancy which he put forth in however strange a garb, and using rather exaggerated language about them. Blake at his best is beyond all exaggeration; but he is not always at his best. Mr. Ross's estimate of him, however, is expressed in perfectly reasonable and well-considered language.

In the *Art Journal* Mr. Rudolf Dircks writes a very good and temperate criticism on the Royal Academy, which is in pleasant

contrast to the sweeping and violent judgments (if they deserve that name) which are too common in contemporary art-criticism. The old subject of the Plantin Museum receives some fresh illustration and description from Mr. Edgcumbe Staley.

The *Magazine of Fine Arts* devotes an article to "The Chalk Drawings of William Strang, A.R.A.," all of those illustrated being portrait heads of remarkable force and character. Sir James Linton contributes an article on "The Sketches of Constable," which he characterises as being really "sketches," reference notes for intended pictures; "they are the antipodes," he says, "of most of the so-called sketches of to-day; they are not got up for exhibition purposes." But is not the fact rather that artists do in the present day exhibit, and are encouraged by critics to exhibit, sketches such as in former times would have been considered too rough to be suitable for public exhibition? Among other articles are "Some XVIIIth Century Chairs in Private Collections," by Mr. Stephen Aveling, and "The Portraits of Nattier," by M. Arsène Alexandre.

The *Architectural Record* (New York) contains an interesting account, by the architects, Messrs. Nimmons & Fellows, of "Designing a Great Mercantile Plant," that of Messrs. Sears, Roebuck, & Co.; an immense working warehouse, for what kind of goods is not specified. The account of the construction of a building of this kind, which is stated to have been insured at the lowest rate ever given to a risk of this character, is of considerable practical interest, as also the description of the means employed to facilitate the carrying on of all the different branches of work with the greatest economy of time and labour. Architectural effect in the exterior has not been overlooked, partly from the practical reason that the firm do not want to spoil the amenity of the district in which many of their best customers reside. In relation to the matter of fire-proof construction, we notice that the system of solid wood floors has been adopted; 8 in. by 5 in. yellow pine laid close together, the top of each floor protected by a saturated roofing felt and with maple flooring boards; these floors are so arranged that water used in case of fire will be drained to scuppers in the outside wall or pass down the stairs and elevator shafts. The same issue contains Part I. of a well-written article by Mr. Jean Schöpfer on "Roman Art," a kind of plea for recognising the really great qualities of Roman architecture in spite of its æsthetic defects.

The *Architektonische Rundschau* contains a fine illustration of a noteworthy piece of modern German architecture in a very florid Renaissance style, a portal of a building in the Neue Friedrichstrasse, by MM. Thoemer & Schmalz, which is exceedingly bold and ingenious, though not in a style that we can profess any sympathy with.

The *Berliner Architekturwelt* contains illustrations of a set of buildings erected in connexion with the working of some large sluices on a canal, which are of much interest; they show how a practical erection of this kind can be made really picturesque by a simple and direct treatment and grouping arising out of the requirements of the case, and without any of what are sometimes called architectural features. This is one of the things in which German architects are often specially successful. Herr Friedrich Lahrs is the architect.

The *Nineteenth Century* contains an article by Mr. H. H. Statham on "The Salons and the Royal Academy."

In the *National Review* Professor Milne writes an article "About Earthquakes," a subject which may have a sinister interest for us all even in this country, as is darkly hinted at the close of the article; and Professor Milne's opinions on earthquakes are probably worth more than those of any other person. The following summary as to the movements of the earth's crust will bear quoting separately:—

"From what we can see and measure we know that within the period of a lifetime; and well within the period of reliable history, certain tracts of country have been sagging downwards, whilst others have been bending upwards.

Since 1811 the Sunk Country in the central portion of the United States has still been sinking. Portions of Afghan Turkestan are rising. The southern part of Scandinavia during the last 100 years has been sinking, while the northern portion has been moving in the opposite direction. Marked indication of corresponding movements are to be found in very many countries round the globe. These movements imply the bending of rocky strata, evidence of which is met with in almost every mountain range we see. It is even visible in the gentle undulations of our Southern Downs. On a journey from the north-eastern counties towards the Isle of Wight, as we pass by quarries and through railway cuttings, we first see chalk in horizontal bands. From the north of London it dips gently downwards beneath that city to rise as the North Downs. Still further south the upward fold, the greater portion of which has been effaced by denudation, is again seen to plunge downwards beneath the Solent, to rise steeply in the Isle of Wight. The arrangement is similar to a series of parallel creases or wave-like folds which can be made in a table-cloth or in a carpet. In many of these folded districts we see that the strata have been fractured, and that beds on one side of a fracture or fault do not correspond to those on the other side. There have been displacements which may be measured by inches or by thousands of feet. The formation of these faults is assumed to be the result of bending, which has exceeded the limits of the elasticity of the bent material. When these displacements are large and take place suddenly, elastic relief, together with the jolting and impact of the settling mass, give rise to vibrations and waves which may shake the world."

In the *Century* is an illustrated article on the Elysée Palace, under the heading "Historic Palaces of Paris," and an article by Mrs. Pennell, with some delightful sketches by Mr. Pennell, on "The Lonely Marne from its Source."

In the *Antiquary* Mr. W. J. Fennell, under the general heading "Some Ulster Towns," writes an article on the history and associations of "Bangor, County Down," now a favourite Irish watering-place, but with a long and interesting history behind it. "So great was the reputation of Bangor University that Alfred the Great, Saxon King of England, sent to it to supply professors to Oxford when he founded or restored that University." Mr. A. C. Fryer continues his article on "A Pilgrimage to St. David's Cathedral."

FIRE TESTS OF REINFORCED-CONCRETE FLOORS.

TWO REPORTS issued this week by the British Fire-Prevention Committee afford some interesting and valuable information relative to armoured-concrete floors from the standpoint of fire-protection. In the first of the two tests described the floor was divided by transverse beams into three panels, each of 6 ft. 9 in. clear span; the concrete was made with Portland cement, Thames sand, and furnace clinker, in the proportions of 1, 1, 2½, and the reinforcement was arranged on the Coignet system. Almost immediately after the gas had been lighted the cement plastering on the ceiling began to blow off with slight explosions. After the expiration of about one hour two patches of concrete, each measuring about 3 sq. ft., fell from one panel, exposing the reinforcement, and smaller pieces blew off from the centre of the two other panels; and after about two and a half hours several cracks were to be seen on two of the beams. The application of water had the effect of stripping the concrete from the underside of the same beams, exposing the steel bars for a length of about 6 ft., and showing the metal to be red hot. Considerable erosion was also caused by water on the under surface of the panels, and several of the longitudinal bars of reinforcement were exposed. The maximum deflection of the floor was about 6 in., and the permanent set averaged 5 7-16 in. This test does not show furnace-clinker concrete in a very favourable light, but it is probable that the considerable deflection of the floor beams may account for the large masses of concrete which were detached. The most obvious features demonstrated by the test were the insufficient proportions of the reinforcement and the inadequate protection of the metal against the effects of heat.

In the second test described another Coignet-system floor was tested, but this time the concrete was made with blast-furnace slag, the spans were reduced to 5 ft., the reinforcement was much stronger, and the steel was covered with concrete on the underside to the thickness of 1¼ in. in the panels and 1½ in. in the beams. Further, the beams and panels overhung the testing-hut by 3 ft. 4 in. at each side in the direction of the beams, and the panels projected 1 ft. 8 in. at each end. Nevertheless, at the expiration of half an hour, the floor began to deflect, and continued to do so until the maximum deflection of 4·3 in. was reached, the permanent set being afterwards found to average 1¾ in. On the application of water sufficient concrete fell from two of the beams to expose the reinforcement for lengths of 4 in. and 6 ft. respectively, and the steel was seen to be red hot. The under-surface of the panels was also eroded where struck by the jet, and on removal of the load the upper-surface of the floor showed transverse and diagonal cracks. Although this floor was classified as "fully protective," it should be noted that, in spite of the assistance rendered by the overhanging portions of the beams and panels, the reinforcement was not able to resist deflection so fully as could have been desired. No doubt if the steel had been more adequately protected from heat by a greater thickness of concrete the deflection would have been much less, but it is not improbable that some methods of disposing the reinforcement may be better than others for withstanding deflection at high temperatures. This is a point which can only be settled in a satisfactory manner by comparative tests upon different systems of reinforced-concrete floors. In the meantime the important, but by no means new, lesson to be learned from these two tests is the absolute necessity for an ample thickness of concrete to protect embedded steel from the effect of fire.

EXPERIMENTAL SCIENCE AND THE BUILDING TRADES.

ON Monday last at the London County Council School of Building, Ferndale-road, Brixton, Mr. Alan E. Munby, M.A., delivered the first of two lectures on "Experimental Science and what it has done for the Building Trades." In his prefatory remarks Mr. Munby said that even the antagonist to science nowadays appreciated its applications and the benefit he received from the work of the scientist in the laboratory, but there were very few people who appreciated all that had been involved in making those applications. Those of them who wished to gain information on that point were rather apt to look simply at the harvest without troubling to know anything about the seed-time. Take the case of a man who wanted to rear a house on a very slight foundation. He might object to the cost of putting in deep foundations on the ground that the work would be underground, and that the money would be wasted. The contention might be accurate for a time, but perhaps a little later on the man wanted to add another story On examination it might be found that the foundations would not permit of that, and that was where they would find themselves if they did not give a little more attention to science in their work. It was particularly curious that so little attention should be given to the claims of science in this country and that so few people appreciated the work done in laboratories. It was the more curious because some of our greatest natural laws had been discovered by Englishmen, and also some of the greatest applications of those laws. The man of science experimented with things that were unknown, and he wanted to learn something more about them. He tried to solve the problem according to some preconceived scheme, he thought out what he was going to do, and then he conducted his experiments with a view of finding out the exact thing. The experiments alone, however, were not the whole of his work. What he did was to make a series of experiments and then to consider in the light of the results whether he could get any general statement from them. It was, however, not enough for the scientist to know that certain things happened—he wanted to find out the cause, and in that respect all workers might emulate the scientist, for it was always a healthy tendency for a man to know in his work why certain things happened. It was by the patient work of the scientist that they had got those two great laws which stood at the basis of all the sciences—the law, for instance, of the indestructibility of matter. That law, which told them that nothing could be destroyed, stood at the very basis of chemistry. Then they had got the great law of the conservation of energy, which told them that energy could not be destroyed, although it

might be transformed. That great law formed the basis of the science of physics. Then they had the law of gravitation, which told them from the way in which two bodies moved how they would act upon one another. If they considered why it was that science had advanced so rapidly during the last century he thought it would be found to be due to those causes. If they looked back one hundred years they would find that science was in a very poor way indeed; there was very little chemistry, physics was a little more advanced, but there were none of the applications of science as they had them at the present day. He did not think the advance in science could be put down to the increase in mechanical skill, to fortuitous circumstances, or to the demands of mankind; they must put it down to those natural laws which had been the basis of all scientific work. By those laws they could predict what would happen under certain circumstances, and at once a whole flood of light was thrown on a thing. They were not at the end of their scientific knowledge or by any means in possession of all the natural laws—in fact, it was not too much to say that we stood at the very threshold of knowledge itself. Vast progress had been made during the last few years, and, therefore, it was very necessary to remember that pure science was not a thing of the past but a thing of the present, and they wanted to develop it just as they wanted to develop their applications. They wanted to take their work into actual research, which would enable them to study new conditions. The work might seem rather tedious, but it would always pay a workman to take up a certain amount of pure science, because it was not as if we were fighting for our hands for a few years ahead; but we were living for the future, and, therefore, it would pay us to make our foundations as broad as was possible. The man who took a real interest in his work would look very much higher than the financial aspect of it, although, of course, that was important. In the national aspect they had got to remember that other countries took very much more interest in science as a rule than we did. The French, the Germans, and the Americans venerated pure science, and it behoved us to take care that we as a nation were doing enough in this direction. It was simply because of their science that Germany had got the large dye trade which was of such great value to them. Let them remember that the work of the laboratory to-day was the work of the workshop to-morrow, and if we did not lay down our work in the laboratory and obtain the help of all these new principles, then we should be left behind in the race. It was the new industries that were the paying industries and which helped to make a country flourish. If they got a nation that was very keen on pure science it would develop it until finally it would yield some direct applications to a new industry, and then that nation would have the whole field for that new industry. Take the cement industry. That, to its credit be it said, had developed on scientific lines of recent years, but at the same time the Germans were going ahead very rapidly with cement, and very valuable public prizes were at the present time being offered there for researches on cement. The result of those prizes probably would be greatly to stimulate research, with the object of finding out the chemical composition of cement in their manufacture and use. There was a great deal yet that we did not know about cement—why it was that it set in a particular way, and what was its exact composition. It seemed likely, therefore, that we should have German cement in the front of the market, because if something was wanted for a particular purpose the relation between its use and its composition would be definitely known. There were three sciences which were particularly applicable to things connected with building work — chemistry, physics, and geology. Physics dealt with energy and matter, so that the suitability of structures, the action of mechanical forces upon things, the expansion of bodies with heat and cold, the question of lighting, hot-water problems, and questions of sound-proof divisions were all based on the science of physics. Chemistry dealt with the ultimate composition of things; its object was to investigate as to what bodies were composed of, how the particles were put together, and by that means they were able to predict what would happen under certain given conditions. Geology was of value to them because of the enormous number of natural materials which were obtained from the crust of the earth. All our building-stone and timber grew on the earth's shell, and it was very necessary to know something of the way in which that shell was constructed. By the application of chemistry they were able to find out the causes of rusting and decay in materials, and they would find that ordinary decay really consisted of a series of mechanical changes. It was impossible, of course, to prevent decay entirely in building materials, but their object in choosing materials should be that there should be as little decay as possible. The ideal building no doubt would be one built on the principle of the "one-horse shay"—made equally strong in all parts. That would be the ideal building—one in which all the materials were equally strong. Unfortunately, they could not do that; all they could do was to attempt to proportion the strength of their materials to their uses. That was sometimes overlooked, and stronger materials than were really needed were used. They wanted, as far as possible in their building work, to balance the parts and not use herculean materials in one part and very poor materials in another; that was a mere waste of money. The two chief agents in decay were air and water. Rusting would not take place either in air or water; it must be a combination of the two things. In concluding his lecture, which was illustrated by a number of practical experiments, Mr. Munby said that one of the best ways to note the effect of acid gases in the air on sandstone and limestone was to place a small piece of the stone in a bottle and pour on a little diluted sulphuric acid and note the effects.

SAN FRANCISCO.

[FROM A CORRESPONDENT.]

SUFFICIENT time has now elapsed since the devastation of their city in April to enable San Franciscans to look the complex problem of its rebuilding squarely in the face. Some data may be noted in this connexion of interest to the British industrial community at large.

A careful canvass of the iron trade in the city reveals the fact that, while many inquiries have been received—one involving 50,000 tons of structural steel is a record—no important orders have been actually placed in this market. Some fairly good orders have been taken within the past thirty days by Belgian rolling-mills. Manufacturers in Belgium understand the physical and chemical requirements as to structural steel for America, and now roll to American standard, at least as far as sections, beams, and channels are concerned. It is stated that these shipments will be largely composed of "longest stock lengths," and such miscellaneous angles, channels, and beams as are used to a limited extent by the riggers of San Francisco. Many persons look upon the placing of orders in European hands as a foolish expedient. They point out that nearly all steel structures erected in their city up to this date have been manufactured and fitted in Pittsburg or Philadelphia, and laid down at their destination complete to the last bolt and ready for building. Everything as regards the up-building of the city depends upon the dispatch with which the insurance companies settle the claims of property-owners. It is safe to say that not more than a score of citizens are ready to proceed with plans until this phase of the question is settled.

Later on, when money is in hand, some business will undoubtedly be done with English manufactories with specifications for structural steel, punched, fitted, and marked ready for assembling. A serious obstacle may interpose, however, in that the American Labour Union of Riggers may refuse to handle material purchased outside the U.S.A.

The financial aid freely offered by American steel mills will also have a minimising effect on orders to be placed in foreign markets. It is said that a San Franciscan steel importer, who has been rendered practically insolvent by the earthquake, has been offered 20,000*l.* worth of material "to be paid for when possible." A banker's letter of credit would have to be in evidence when trading with a foreign supplier.

THE BUILDING TRADES DIRECTORY.

A NEW edition, the tenth, of their excellent Directory of the Building Trades has been issued by Messrs. Kelly's Directories, Ltd. (182-4, High Holborn, W.C.), which appears to be as carefully compiled as any of its predecessors. The directory is published at intervals of four years, and the first edition appeared in 1870, so that for thirty-six years those connected with the building trade have had within their reach a work which must be as indispensable to them as is the Post Office London Directory to the general public, and which is as well arranged and as accurate as the Post Office Directory. The work is intended to give a complete list of all the trades and occupations connected with the industry, and in addition to a long index of towns and places mentioned in the volume, as well as an index of trades, it includes a list of County and Borough Surveyors in England, Scotland, and Wales; a section devoted to the building trades in the various towns and villages, arranged alphabetically, under the various counties of England, Scotland, Wales, and Ireland, the Channel Islands, and the Isle of Man; and a classification of trades in London and suburbs and in the provinces and Scotland and Wales. There are some 2,600 pages to the directory, excluding advertisements, which are wisely kept apart from the letterpress. The work, the price of which is 30*s.*, is a model of what such a book should be.

THE COST OF ERECTION OF SCHOOLS.

THE following Report of the Education Committee of the London County Council was submitted at the last meeting of the Council before the Whitsun recess, but its consideration was postponed:—

"On February 20, 1906, we submitted a report with reference to the preliminary plans of new public elementary schools proposed to be erected on sites in (i.) Lawn-lane (Kennington), (ii.) Fountain-road (Wandsworth), and (iii.) Franciscan-road (Wandsworth); and also of a school for special instruction to be erected on the Janet-street site (Poplar). On April 10, 1906, we submitted a further report in reference to the plans of these schools, and it was then decided that certain modifications should be made in the specification with a view to reducing the cost, and that for the purposes of comparison tenders should then be obtained both upon the original and the revised specifications. We have carefully examined the whole question of the cost of erecting schools, and in dealing with the result of our inquiry we think it would be of interest to the Council to preface our report with a brief statement of the history of the evolution of school planning and the steps taken by the late authority in this matter, to which reference was made by the last chairman of the late School Board (Lord Reay) in his valedictory address at its final meeting on April 28, 1904:—

"We are so used to the sight of the handsome school buildings which are such prominent features in most parts of London, that we are apt to think that the type has been long established. The fact is that, in 1870, a satisfactory plan for a school building was non-existent. The Board had to create it, and the process of evolution was lengthy. It was inevitable that the earlier schools built by the Board should prove defective in the light of accumulated experience, and many of these have had to be altered so as to bring them into harmony with the present standard of efficiency."

From the following remarks it will be seen that the original type of school was erected at a cost per place which could not be maintained when necessary improvements, the result of experience, gradually became adopted.

When the London School Board began its building work, and before it appointed an architect of its own for the purpose, in consequence of the urgent need of more rapid provision of school accommodation, the planning and erection of the first thirty schools were intrusted to various architects. These schools, although handsome in elevation and in some cases built by architects of considerable reputation, were yet ill-adapted for teaching, partly because of the absence of general professional knowledge of the requirements of a good school, and partly because of the very meagre code of the then Education Department, the building rules being of a most elementary description, and such rules and illustrations as existed tending rather to perpetuate defects than to stimulate improvement. The staircases were long, steep, and narrow. Cloakrooms were either insufficient or altogether wanting. Teachers' rooms were practically unknown, as contrasted with the present provision of both head teachers' and assistant teachers' rooms. The classrooms were subsequently found to be of unsuitable sizes, and the scholars sat for the most part with their backs to the windows. Most of the rooms were passage rooms one to another, and, in addition, the sites were small and the playgrounds were very insufficient. In respect of these earlier schools the Education Department allowed a building loan of 10*l.* per child accommodated.

Of necessity, therefore, a great many of these earlier schools, have since had to be improved, halls added, new staircases of a modern type built, and the schools properly equipped with cloakrooms, lavatories, teachers' rooms, etc.

After the Board appointed its own architect, the earlier schools built by him showed no marked departure in planning from the previous types, but gradually a certain improvement was effected. The dominant idea, however, was still that of a school-room holding several classes, supplemented by a moderate number of classrooms. Corridors for reaching the end rooms were introduced, but these were also made to serve the purpose of cloakrooms; they were far too narrow to ensure safety in the event of fire or panic, and the hanging of cloaks in them was inconvenient and dangerous.

In 1883 the School Board began to recognise more especially the importance of left lighting, and with this object in view planned square classrooms for sixty children, with five rows of dual desks, arranged six deep, as compared with the former size, viz., 29 ft. 4 in. by 22 ft. This arrangement was objected to by the Education Department on the ground that desks should not be more than five deep, but the Board adhered to their plans, which were tacitly accepted. From this time the improvement in school planning has been continuous.

About the year 1888, the late authority, in view of the large and increasing amount expended yearly on maintenance account in pointing the exterior walls, etc., and in painting the internal walls, decided that the brickwork should be built in cement in lieu of lime mortar, and that the internal walls of staircases and corridors and dados of classrooms and halls should be faced with glazed bricks. In consideration of the increasing use made of the halls for drill and public meetings, a much heavier and more rigid type of floor construction than had hitherto obtained was adopted.

It was not until the year 1891 that the Education Department so far acknowledged the utility of a hall in a school as to grant a special loan for the purpose for every school. Previously the cost of the hall, when provided, had to be included within the before-mentioned loan limit of 10*l.* per child accommodated unless an allowance was specially made. Consequently the cost was nearly always prohibitive, unless the hall was reckoned in the accommodation, or was of such restricted dimensions as to be more of a corridor than a hall. Since the department allowed a loan of 1*l.* per foot floor space for the halls, the Board were able to provide them in every new school.

In 1891, the Board, which had for several years neglected the provision of drawing classrooms, determined to provide them, and many spacious and convenient rooms have been built over the halls for this purpose.

Another item in the cost of schools is the amount of decorative detail put into them. The policy of the late authority was almost always to give these structures, as public buildings, some dignity of appearance, and to make them ornaments rather than disfigurements to the neighbourhoods in which they were erected. Where in a few cases, striving after the sternest economy has led to very plain buildings being erected, as in the case of Trundley's-road (Deptford), Enfield-road (Hackney, C.), Ellerslie-road (Hammersmith), and one or two others, the resentment of those who contrasted the appearance of these with other schools in the neighbourhood led to a reversion to the more ornamental type.

It was found that the difference between the cost of buildings erected on utilitarian lines and those designed with some regard to materials, colour, and style was about 5 per cent. At the same time this ornamental appearance has been secured either by richness of detail or by a dignified grouping of masses—in some few instances a greater amount of decorative work has been introduced into the buildings than has been permitted to continue after fuller experience of the cost involved.

In recent years, too, the cost of the offices and drainage generally has considerably increased under the stringent requirements of the sanitary authorities. Where the ground is of a treacherous nature, it is customary to use iron soil drains; glazed tile divisions are provided between each water closet in the ranges in lieu of woodwork, which is always subject to damage, and requires periodical painting, etc. Further, single pans, with separate water-waste preventers, are provided in lieu of the trough and automatic flusher. The extra cost of these items on a school for 800 children, of the ordinary type of building and site, may be taken approximately as follows:—

	£
(i.) Building in cement	350
(ii.) Glazed brick facings to staircases and corridors, and dadoes of classrooms and halls	950
(iii.) Additional cost of solid floors of classrooms, and additional strength and rigidity of hall floors	545
(iv.) Additional cost of iron soil drains, single pans and W.W.P., glazed divisions, etc.	750

representing about 3*l.* 5*s.* per place on these items alone.

It sometimes happens that in consequence of the restricted area of the site a playground has been arranged on the top of the school. This topmost floor comprises playground and science and art rooms (to which latter exception has recently been taken in some cases by the Board of Education) and increases the cost of the building by about 3,400*l.*, equal to 4*l.* per place. Were the playground not so provided a larger area of land would be required on the level, which would probably cost considerably more.

On several occasions the question of the cost of erecting schools was carefully considered by the late authority, the more important investigations being conducted in 1887-9, 1892, 1896, and the last in 1903. In 1887 a special committee was appointed to investigate and report upon the whole of the existing arrangements relating to the work of the Works Department of the late authority, and as a result of their report the late authority, on February 14, 1889 (i.) adopted a new specification—the joint production of Mr. Ewan Christian and Mr. Thomas M. Rickman, the professional advisers called in for the purpose; (ii.) arranged for a more extended supervision over the construction of buildings; (iii.) introduced a more elaborate and expensive system of heating apparatus; (iv.) arranged for the brickwork to be built entirely in cement in lieu of mortar; and (v.) adopted glazed bricks to a very much larger extent than had formerly been the case.

In 1892 the late authority desired to ascertain whether it would be possible to obtain from outside architects any fresh ideas in the planning of its schools, and invited architects to enter into public competition, in accordance with the rules of the Royal Institute of British Architects, for the planning of a school for 1,200 children, capable of being erected on any ordinary site purchased by the Board, the President of the Institute being appointed assessor, and to draw up the terms and conditions of the competition. It was further decided that three premiums, of 150*l.*, 100*l.*, and 50*l.* respectively, should be awarded, in the discretion of the assessor, to the architects whose plans were most successful.

The site finally selected was a vacant piece of ground in Fulham Palace-road, and the competition, besides being advertised in the daily and trade journals, was specially brought to the personal notice of a large number of architects. One hundred and twelve architects applied for the instructions, and sixty-one of them sent in designs, which were afterwards publicly exhibited in the upper hall of the "Hugh Myddelton" school, Clerkenwell. The result of the competition was that the assessor, Mr. MacVicar Anderson, reported that it had not produced a novel treatment in respect of plan that had been deemed worthy of approval; and on April 26, 1894, a report was submitted, stating that, as a result of the competition, it was gratifying to find that the schools had not only been erected upon what might be fairly considered the most approved plans, but that the cost appeared to be as moderate as seemed possible, judging from the estimates forwarded by the various competitors of the probable cost of the schools if erected according to the designs submitted by them.

In 1896 the subject was again the matter of careful investigation, and the late authority then decided, as an experiment, in the case of the next six schools to be erected, to revert to the old specification in force in 1885-6, subject to the specification being modified to meet the then requirements of the Board and the Education Department, it being arranged that in the building contracts the quantities should not form part of the contract.

Every detail of the specification was then examined, and, after being tabulated, decisions were arrived at which became instructions for the description of the building of the schools.

The schools subsequently selected to be built under these special conditions were the following, the accommodation, cost, etc., being as stated in the subjoined table:—

County electoral area and name of school.	Accommodation.	Date of acceptance of tender by late authority.	Actual cost.	Area of site.	Cost a place (main building complete and ready for occupation, excluding offices, works on site, furniture).	Total cost per place (including centres, but excluding furniture, etc.).	Centres, etc., erected and included in total cost.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Clapham.			£ s. d.	sq. ft.	£ s. d.	£ s. d.		
Cavendish-road (Designed for future enlargement)	914	29-7-97	22,400 18 7	87,120	13 7 1	24 10 2	Cookery, laundry, manual (40), also deaf centre	One-story buildings in cement, three halls, drawing classroom, schoolkeeper's rooms.
Lewisham.								
Ennersdale-road (Designed for future enlargement)	756	do.	16,105 3 4	63,480	14 18 6	21 6 1	None	Three halls, D.C. room, S.K. house. In cement.
Greenwich.								
Royal Hill ..... (Designed for future enlargement)	552	10-2-98	12,900 1 11	36,695	15 18 8	23 7 5	None	Three halls, D.C. room, S.K. house (on arches). In cement.
Bethnal Green, S.W.								
Daniel-street ... (Designed for future enlargement)	1,138	31-3-98	23,682 13 10	50,610	14 18 1	20 16 3	Cookery, laundry, manual (40)	Three halls, D.C. room, S.K. house, playground on roof. In cement.
Bermondsey.								
"Paragon," The (Designed for future enlargement)	1,111	12-5-98	27,746 4 7	67,630	16 2 7	24 19 6	Cookery, laundry, manual (40), and domestic economy school	Three halls, D.C. room, S.K. house. In cement.
*Oakfield-road ... (Complete school)	922	29-6-99	19,794 19 6	35,425	14 7 2	21 9 5	Manual centre...	Three halls, D.C. room, S.K. house. In cement mortar.

* This school was subsequently transferred to the Penge education authority.

The last occasion on which this question was considered was in 1903, as a result of observations made by the chairman of the Croydon School Board, at the public opening of the Portland-road school, having accommodation for 1,310 children, to the effect that the cost of building (exclusive of site and furniture) had been 13*l.* 11*s.* 8*d.* a place, as against a cost of 28*l.* 10*s.* and 30*l.* 15*s.* 4*d.* in two London schools.

In order that a comparison might be made between two schools, where the conditions of planning, etc., were as nearly as possible identical, the Invicta-road school, Westcombe Park (Greenwich), was taken as corresponding fairly in general arrangement and size with the Portland-road school, Croydon. The Invicta-road school, which was built in 1898, has 965 places, and cost 20*l.* 7*s.* 4*d.* a place. The graded portion of both schools consists of a two-story building, the infants being accommodated in a separate one-story building. A comparison was made, item by item, of the various branches of the work done at these schools, and a very full examination was made of materials, quantities, and prices. The sub-committee which then reported arrived at the conclusion that the facts before them showed "that, having regard to the accommodation provided and the character of that accommodation, and the conditions under which the London School Board are required to work, the London Board have had their work done quite as cheaply at Invicta-road as the Croydon Board at their Portland-road school." It was ascertained that the cost of the school buildings complete, excluding offices, works on site, furniture, etc., amounted to 14,806*l.* for the Invicta-road school, and 14,491*l.* for the Croydon school.

In the course of the inquiry it was ascertained that it was cheaper to build a school in two separate blocks, consisting of a two-floor building for the graded school and a one-floor building for the infants' department, than in a single block of three or four floors; and in planning new London County Council elementary schools, this practice is adopted wherever the site is of sufficient size for the purpose. This was accounted for by the fact that, although, in the case of a three-story building there is a saving in having to provide only one roof, this saving is more than counterbalanced by the additional cost of the greater thickness of brickwork required for the walls, the extra cost of scaffolding to the upper floors, and the cost of hoisting joists and girders to a great height, etc. This fact compelled the Board to scrutinise carefully its system of planning, which, owing to most of the schools being built in the heart of London, has been predominantly one involving three-story structures. It should be stated that it was the practice of the late authority, when securing vacant sites in outlying districts, to acquire sites having an area of about two acres. The following shows the relative cost of erecting (i.) a three-story building compared with (ii.) three one-story buildings (boys, girls, and infants), and (iii.) two-story building (boys and girls) and a one-story building for infants:—

(i.) Three-story building of ordinary type, Broadwater-road (Wandsworth) (accommodation 920):—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 20,948*l.*, equivalent to 22*l.* 15*s.* 4*d.* a place.

(ii.) Three one-story buildings, Deansfield-road (Woolwich) (accommodation 1,202):—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 21,953*l.*, equivalent to 18*l.* 5*s.* 3*d.* a place.

(iii.) Two-story building and a one-story building, the "Wandle" (Wandsworth) (accommodation 1,140):—Total estimated cost, including works to site, offices, etc., but excluding furniture, etc., 23,337*l.*, equivalent to 20*l.* 9*s.* 5*d.* a place.

We now pass to the result of our investigations into the cost of erecting schools in London, as compared with the cost of schools recently built under the jurisdiction of education authorities whose areas are contiguous to London. In this connexion we have consulted the County Councils of Surrey, Middlesex, and Kent, the Boroughs of Hornsey, Wimbledon, and East Ham, the County Boroughs of Croydon and West Ham, and the Urban District Councils of Willesden and Chiswick. From the information which these authorities were good enough to furnish, we were of opinion that the schools erected under the jurisdiction of the Croydon

Willesden, and Hornsey authorities were the most suitable to select for purposes of comparison, and some of our members have visited, in company with several members of the Council interested in the construction of schools, the latest schools built under the direction of these authorities. The subjoined statement shows the accommodation and cost of the schools that were inspected :—

Name of educational authority.	Name of school.	Total accommodation.	Date of completion.	Total cost (including furniture, supervision, architect's charges, etc.).	Total cost per place.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
				£ s. d.	£ s. d.	
Croydon	Ingram-road	1,166	1904	17,110 0 0	14 13 6	Two-story building for boys and girls; one-story building for infants.
	Portland-road	1,310	1901	18,439 0 0	14 1 6	Two-story building for boys and girls; one-story building for infants.
Hornsey	Mattison-road ...	900	1903-4	23,009 5 0 (excluding special instruction school)	25 11 3	Two-story building for mixed children; one-story building for infants.
	Pemberton-road Higher Elementary School	340	1903-4	16,221 12 10	47 14 2	Two-story building for mixed children.
Willesden ...	Chamberlayne Wood-road	1,224	1902-3	19,000 0 0 (excluding centres and special buildings)	15 10 6	Three-story building, including three halls.
	Salusbury-road ...	1,260	1901-2	19,695 0 0 (excluding centres, etc.)	15 12 8	Three-story building mixed school, central hall through two stories with balcony, and infants' hall.

We found that the Croydon schools afforded all the requisite accommodation, and presented many good points in comparison with the Council's schools.

In the Croydon schools the general arrangement of the roofs and gutters was suggestive of a country school rather than a town school, and were correspondingly cheaper; in the staircases and corridors the glazed brickwork was carried only to the height of the dado, while in the Council's schools it is carried the whole height of the wall. The dipped bricks used for the dadoes in the Croydon schools, though of a specially cheap make, are more expensive than the soft glazed bricks used in the Council's schools, but there was nothing in the Croydon schools corresponding to some of the corridors at Bonneville-road school (Clapham), which are built in white glazed bricks from floor to ceiling. The covered playgrounds were small.

On the whole, we have arrived at the conclusion that we should not like to exchange any of the recently-erected London schools for one of the Croydon schools, though something may be learned from Croydon in connexion with the cheapening of the design of the roofs and in the more restricted employment of glazed bricks, and we intend to take advantage of the information gained on these points.

As regards the schools in Hornsey, the ordinary graded school at Mattison-road consists of a two-story building for the senior school and a one-story building for the infants. The woodwork was prominent and expensive, and a good deal of the cost of the roof of the hall in the senior school lay in detail. The manual training room was palatial as compared with the rooms which have been specially constructed by the Council or by the late authority.

In the laundry the washing was carried out in fixed wooden tubs with water supply and waste. The kitchen was well designed, with the scullery forming an open annexe, but there was only one kitchen range and no fireplace similar to that to be found in an artisan cottage. The swimming bath was about 40 ft. long, which was too short for the requirements, inasmuch as it involved a somewhat dangerously steep floor. The gallery was provided with dressing boxes.

Throughout the ground floor of the building, comprising the swimming bath and domestic economy centre, there was a profusion of glazed bricks, and the 22-in. walls were unnecessarily heavy.

The housewifery department consisted of a well-furnished sitting-room, bedroom, and kitchen with scullery attached.

We are of opinion that the Council would not secure economy by following the example of the Hornsey local authority in any particular except, perhaps, that simple tiled roofs with eaves gutters are less expensive than lofty parapets.

The higher elementary school at Pemberton-road, Hornsey, was organised as a secondary school for 340 children under sixteen years of age. The accommodation included a good room for the headmaster, classrooms, a hall about half the size necessary for a secondary school, and incommoded by a row of iron columns, a chemical laboratory for twenty-four, an experimental science laboratory for twenty-four, a balance room, a preparation room, a demonstration theatre, and a good art-room, with special wall fittings made to the design of the head master. There was, however, no dining-room, kitchen, common room, library, or gymnasium, so that the building fell considerably short of the accommodation generally provided in a secondary school.

The brickwork was carried out in lime mortar, with a profusion of glazed bricks, and in particular two 14-in. longitudinal walls were carried right through the building on both upper floors, one on each side of the corridor, the weight of one of these walls on the first floor necessitating the columns in the hall above referred to.

As regards the two schools we visited at Willesden, the Salusbury-road school comprises an infants' department and a mixed department. The Chamberlayne Wood-road school is organised as infants, girls, and boys. The former school has an infants' hall on the ground floor and a hall for the mixed department, extending through two stories with a gallery. The latter school has a hall for each department. Both schools were planned very much on the lines of the majority of the three-story buildings recently erected in London, but in neither school was there any provision for science or drawing, the buildings comprising only the halls, classrooms, rooms for the head and assistant teachers, and cloak-rooms.

The first point that was noticed was the economy observed in the erection of the playing sheds. These were supported on slender iron columns, the roof being carried by a timber plate and covered with zinc. In the staircases and lobbies there is a glazed brick dado surmounted by plain distempered brickwork. As in the case of some of the London schools, economy was effected by providing no fireplaces except in the babies' rooms.

With the exception of the roof principals of the two-story hall in Salusbury-road school, the joinery was of the simplest possible character.

Except, perhaps, in the arrangement by which a store-room was provided in a mezzanine above the ground floor corridor, and in the cheaper construction of the sheds in the playground, it did not appear that the schools exhibited any points which should be imitated in the Council's schools. Generally speaking, they appear to have been carried out on the same lines as the Council's schools with the practice of certain small economies.

The plans and specifications of two schools built under the supervision of the Chiswick and West Ham local authorities were also kindly lent to us, and, after a careful perusal of the specifcations and a full examination of the drawings as to plan, etc., we have arrived at the conclusion that very little difference, if any, exists—indeed, in one or two cases the specifications involve work of a more costly nature than that adopted in the Council's schools.

We submit a statement, showing for the last seven years the number of new schools for which tenders were accepted, together with the accommodation, the total amount of the tenders, and the total average cost a place (see below).

We also append particulars relating to the cost of nine typical schools, the tenders for which were amongst the last accepted by the late authority, and in comparing the cost per place in the foregoing and in the following table with the cost per place in the Croydon and the Willesden schools, it is very important to notice that the average

Year ended December 31.	Number of new schools for which tenders were accepted.	Accommodation of schools.	Total amount of tenders.	Average cost per place of main building complete and ready for occupation (exclusive offices, works on site, furniture).	Average total cost per place (exclusive furniture, supervision, etc.)
(1)	(2)	(3)	(4)	(5)	(6)
			£ s. d.	£ s. d.	£ s. d.
1899	11	9,113	256,580 5 6	17 16 11	24 7 2
1900	10	9,032	257,477 0 0	20 3 4	27 7 6
1901	6	5,188	121,828 0 0	20 1 0	28 17 1
1902	8	6,970	164,653 0 0	17 6 3	23 12 5
1903	18	16,521	367,829 10 0	15 11 3	22 3 6
1904	6	5,932	125,184 0 0	16 4 7	21 19 11
1905	3	2,820	61,300 0 0	16 9 11	22 4 5

County electoral area and name of school.	Accommodation.	Date of acceptance of tender by late authority.	Amount of tender.	Area of site.	Cost per place (main school buildings only).	Total cost per place (including centres, but excluding furniture, etc.).	Centres, etc., erected and included in total cost.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			£ s. d.	sq. ft.	£ s. d.	£ s. d.		
Wandsworth. Hearnville-road ...	1,002	24-3-04	17,146 0 0	61,960	13 12 6	17 2 3	—	Two-story building for boys and girls; one-story for infants.
Lewisham. Stillness-road	1,124	29-10-03	22,268 0 0	87,120	12 11 0	19 16 2	—	One-story buildings.
Wandsworth. "Southfield"	980	23-7-03	19,419 0 0	258,250	13 7 11	19 16 3	—	One-story buildings.
Stepney. Myrdle-street	923 elementary 392 higher grade	28-5-03	29,031 0 0	39,185	13 12 9 elementary 27 6 5 higher grade	22 1 6 on both buildings	—	Three-story building with playground on roof. Including higher grade school for 392 scholars. £207 18s. 6d. less than School Board voted.
Fulham. New King's-road ...	892	28-5-03	21,271 0 0	48,345	15 15 1 exclusive of special school.	21 17 1 exclusive of special 23 16 11 with special school	Special school for 60	Three-story building.
Wandsworth. Broadwater-road ...	920	19-3-03	20,948 0 0	77,400	14 14 4 graded school only	20 19 9 without special 22 15 4 with special school	Special school for 60	Three-story building. £197 15s. 3d. less than School Board voted.
Fulham. Macmurdo-road ...	1,142	24-7-02	24,950 0 0	77,855	16 7 11	21 16 11	—	Three-story building. £653 15s. 4d. less than School Board voted.
Wandsworth. Ensham-street	962	15-5-02	25,522 0 0	93,654	18 11 6	26 10 7	Manual training centre, 40	Three-story building. £1,608 3s. 2d. less than School Board voted.
Lewisham. Kilmorie-road	908	18-7-01	22,096 0 0	87,120	16 0 0	24 6 8	Do.	Three-story building. £725 6s. 9d. less than School Board voted.

accommodation in the London schools is much lower than that in schools under the Croydon and the Willesden authorities.

The average number of children accommodated in each of these schools is 1,027, the average cost a place of main school buildings only is 15*l.* 9s. 2d., and the average total cost per place calculated on the total amount of tenders is 21*l.* 18s. 5d.

It should be noted that in none of the cases referred to in the above statement did the cost exceed the amount of the loan allowed by the Board of Education on the capital cost. This is the more noteworthy in that the loan for the main building was still only 10*l.* per child, with certain special allowances which were added from time to time.

When the question of reducing the cost of buildings to be erected for a certain purpose and of an accepted type is under consideration, there are only two ways in which it can be effected—(i.) by reducing the requirements or being content with a smaller or simpler building, and (ii.) by lowering the standard of the building. With regard to (i.) the required accommodation has to be provided in classrooms, graduated in size according to the numbers for which the school has to be built. These classrooms have to satisfy the code with regard to the number of superficial feet for each child, and the heights are also stipulated for, proper entrances and exits, cloakrooms, containing a peg for each child, adequate lavatories, stock-rooms, teachers'-rooms, and offices have to be provided according to a scale laid down in the code, and, as each classroom has to be approached separately, it is evident that corridors or halls have to be provided for the purpose. If the school is planned with proper regard to its use for teaching purposes, the central hall plan is the best and most economical, by reason of the fact that, if properly arranged, the hall supplies the place of corridors, and, as the head teacher's desk is placed therein, proper supervision of the whole department is secured. The value of the central hall for school work has been so thoroughly appreciated that it has been decided to spend a yearly sum in providing these and other modern adjuncts to the schools built in the earlier years of the late authority and not provided with them.

As regards the provision of rooms for special purposes, such as art, science, manual, and domestic work, it would appear that an art or drawing classroom is not now considered a necessary adjunct to every elementary school, but that a room for general science is desirable. As regards manual training rooms, it is a question whether such rooms should be built for forty or twenty boys, or should be in the nature of centres for groups of schools or adjuncts to each school. As regards housewifery centres, we cannot consider an ordinary domestic house suitable therefor, and certainly their construction is never such as to fulfil the requirements of the Building Acts for a public building, which they undoubtedly become as soon as they are used for teaching purposes.

With regard to (ii.) when the alternative tenders, which are about to be obtained for three new schools sanctioned by the Council, are received, there will be an opportunity of ascertaining what the savings under the various heads of the revised specification will amount to. The principal suggestion is for building the brickwork in lime mortar instead of cement. Whatever the saving may show under this head, the late authority and the Council has had experience of the cost and inconvenience involved in repointing buildings, inevitable after a certain time when built with lime mortar; the cost in the case of a school of the ordinary size and type is about 350*l.*, while the nuisance from the dust caused by the raking out of the joints and the erection of scaffolding and the presence of workmen on the premises during school hours, with the consequent risk of accidents. Again, piers carrying girders and heavy weights must be built of a larger size if not in cement: so that, taking all these matters into consideration, we cannot consider the saving on the initial cost desirable, especially considering that the after expenses would fall on the rates of the year.

For a proper comparison to be made of the cost "per place," the cost should be based not on total cost, including the site, but on the main buildings complete and ready for occupation. The site difficulty affects the total cost so much that the whole calculation is vitiated by having to deal with such sites as Plum-lane (Woolwich), Invicta-road (Greenwich), New End (Hampstead), and others, whereas level rectangular sites like Townmead-road (Fulham) and similar ones present no unusual or costly difficulties. Further, taking the maximum size of a department as for, say, 300 children, and building originally for, perhaps, 200, the hall is built of the requisite size for the full number to be accommodated in the completed school. Generally the cloakrooms, teachers'-rooms, lavatories, etc., are also built complete, and this provision for future requirements, while it adds to the initial cost, is really a considerable saving to the Council, as when the additional classrooms are erected the further cost is about 7*l.* 10s. per place.

The true test of the cost of a building is its cost per foot cube on the main building, and we venture to assert that no buildings of a public character have been built in the manner in which schools have been erected at a smaller comparative cost. The architectural features of an expensive nature have been reduced to a minimum, and effect obtained by carefully studied proportions and grouping. By way of illustration, three types of schools built within the last three years are given below:—

Electoral area and name of school.	Story.	Accommodation.	Cost per foot cube (main buildings complete and ready for occupation).
Wandsworth.			d.
Broadwater-road	Three stories	920	7·90
Fulham.			
New King's-road	Do.	1,148	8·31
Dulwich.			
Denmark-hill	Two stories (graded departments), one story (infants)	996	7·83
Wandsworth.			
"Wandle," The	Do.	1,140	8·85
Southfields	One-story buildings	1,126	6·70
Fulham.			
Townmead-road	Do.	1,134	7·14

We feel confident that, upon a comparison being made between school buildings and buildings erected by the Council for other purposes, the result will be favourable to the schools.

With regard to the planning of the schools and their fitness for teaching purposes, it may be stated that the architect to the Board of Education has published, with permission, plans of some of the modern schools of the Council, as types of what such buildings should be. In this connexion we think it would be of interest to the Council to have before it when considering this report a sheet of diagrams (which will be laid upon the table) showing various types of schools, of which we present the subjoined explanations:—

A and B represent elevation and plan of the Trundley's-road school (Deptford), a building designed with an effort to reduce cost by erecting a school without any architectural features—simply of plain stock bricks, slate roofs, and without architectural embellishments of any kind, at the same time obtaining the standard of building and the completeness of plan by which a satisfactory school building, apart from its external appearance, is secured.

C and D represent the elevation and plan of a type of school in which the architectural adornment was carried beyond the general standard of the late authority, the walls being faced with red brick, and terra-cotta being introduced to a considerable extent.

E and F is a type of school similar in plan to D, and designed in a similar manner, the walls being faced with stock bricks with red arches and dressings to the windows, terra-cotta being introduced sparingly, and the roofs covered with red tiles. The cost of a school of this design as compared with A works out at about an additional 5 per cent. on account of the architectural features, and is a type which was reverted to by the late authority in preference to the bare and barrack-like appearance of A.

G is a plan of a school which was worked out to embrace the minimum of the requirements of the Board of Education for a school of that number. It has been a type adopted with more or less unimportant modifications at Stillness-road (Lewisham), "Southfields" (Wandsworth), Deansfield-road (Woolwich), Timbercroft-road (Woolwich), and other sites where the area was sufficiently large to admit of the erection of one-story buildings. This is a plan which the architect to the Board of Education has illustrated as the type of an ideal school, and it will be observed that corridors giving access to the classrooms are eliminated altogether, the central hall answering the purpose, giving complete control and supervision over every classroom. It is also a type which is mentioned as costing 6·70d. per foot cube, being, in our opinion, about the cheapest type of school which can be erected.

Conclusions.

There are so many special features to be taken into consideration in regard to the area, the shape and adaptability of each site and the situation of the school thereon, the accommodation required for each department, and the need for future enlargement, that it is not possible to estimate closely the cost which will be incurred in respect of any school proposed to be erected until the plans have been prepared and the quantities taken out. There is no doubt that in many cases the elevation of the school and the architectural features in connexion therewith have not been designed with so strict a regard to economy as to the pleasing and dignified appearance which has enabled a school to adorn the neighbourhood in which it has been placed. In this connexion the "Oliver Goldsmith" school, Peckham-road, may be cited as a case where the late authority indulged more freely in ornament, because the Camberwell Metropolitan Borough Council appealed to the Board to put up a building in harmony with the importance of the thoroughfare.

As regards the sanitary fittings and arrangements in connexion therewith, there appears to be a general impression that these could be of a considerably less costly description, approximating more closely to one of the standards in use in the erection of dwellings for the working classes. We venture to point out that this impression is hardly borne out by facts, and that such a standard would scarcely suffice in view of the rough usage to which the school fittings are liable to be subjected. Further, the comparison hardly applies, inasmuch as in the case of the dwellings one closet only is required to each and the number of closets in the lodging houses is small as compared with the liberal supply in the schools (provided in blocks and required by the code of the Board of Education). When it is remembered that the total number of separate closets amounts to about 6,000 or 7,000, the importance of having a substantial and durable type of fitting, pan, etc., in the first instance provided out of loan will be readily appreciated, especially when it is recollected that the cost of all subsequent repairs—thus reduced to a minimum—comes out of the rates of the year. The use of iron drains will be abandoned, except where the drains pass through made up ground or under buildings.

As regards wood block flooring, we propose to effect a saving under this head by substituting in the classrooms flooring on fillets on the concrete, thus limiting the use of wood block flooring to the halls and corridors only. It is also proposed to reduce somewhat the cost of the glazed bricks by providing these dado high only in the corridors with plastered walls above.

The playsheds will, without material disadvantage, be simplified in construction and reduced in cost by the use of iron columns.

The standard pattern of sashes and fittings, together with substitution of cords, pullies, and quadrant stays for the present metal window gearing will be provided for.

We do not advise that the specification should be altered in regard to the requirements for "picked" stocks, the saving in cost being so trivial. This remark applies also to the cisterns, in view of the material sanitary advantages gained as compared with the use of ordinary cisterns in lead or galvanised iron, to say nothing of the saving in labour in cleaning.

The instruction to obtain from warming engineers competitive schemes for providing systems of warming by low-pressure hot-water apparatus is already being followed in the case of the new schools in course of erection on the sites in Senrab-street (Stepney), and Sellincourt-road (Wandsworth). It will then be possible to obtain a comparison in cost with the present systems, and, should a saving result, the usual provision now included for warming can be reduced. We propose to look carefully into this question, and to submit a further report thereon at a later date.

We have instructed the architect (Education) in all future cases to lay before us a report showing the estimated cost of all portions of the proposed buildings above the floors actually occupied for ordinary teaching purposes. We also propose to consider carefully in each case whether expenditure can be reduced by the omission of rooms for art classes, and ordinary drawing classrooms in the roof. By the omission of this story there will be a saving of as much as possibly 800*l.* or 900*l.* in the cost of a school, while by making reductions in the cost of carving and general architectural embellishments in all suitable cases, by excluding as far as practicable from the specifications the use of special patented articles, and by making the other reductions already alluded to, we hope to effect a further saving. It must, however, be borne in mind that while the provision of a roof playground adds very materially to the cost of the school, it is only arranged in those cases where the site is small and the cost of additional land is prohibitive, and to that extent the extra cost of building is the result of a saving in the expenditure on the site.

We have also decided to throw the tenders open to public competition more frequently, though there are manifest advantages in confining the competition to a large selected list of contractors who are acquainted with the special requirements of this class of work.

We think that the experience gained on many points while engaged in this investigation will result in a decrease in the future cost of erection of public elementary schools without detriment to the necessarily high standard of quality and efficiency which the Council should maintain. We have had submitted to us plans of a typical school for 1,176 children, consisting of three one-story buildings to be erected on a perfectly level and large site to be selected, requiring no retaining walls or terracing, nor extra deep foundations, the boundaries being of oak fencing instead of a brick wall, and the specification providing for the reductions already agreed to by the Council and the further modifications suggested in this report. The cost of a school of this design is estimated as follows:—

Main school buildings complete, 13,664*l.*, equivalent to 11*l.* 12s. 4d. a place.
Main school buildings, including inclosing and draining site, etc., 17,834*l.*
Total cost, including possible extras, lithography, furniture, supervision charges, etc., 19,659*l.*, equivalent to 16*l.* 14s. 4d. a place.
The cost per foot cube is 6¼d.

We desire, in conclusion, strongly to represent to the Council that it is a very extravagant proceeding to plan schools for subsequent enlargement in growing neighbourhoods, instead of building the complete school at once, where it is known that the full accommodation will be required in a short time, but we have up to the present been unable in these cases to obtain the sanction of the Board of Education to build slightly in advance of actual immediate requirements."

THE LETCHWORTH GARDEN CITY.—Mr. J. M. Dent, the publisher, has decided, it is stated, to remove his works, with over 200 *employés* and their families, from the City of London to the Garden City at Letchworth, and to erect new works communicating direct with the Great Northern Railway. About 110 "London unemployed" are at work at Letchworth excavating land for the new goods yard of Garden City. An area of 13 acres has been acquired by the Great Northern Railway Company for this purpose, and the levelling involves the removal of over 30,000 cubic yards of earth. The unemployed fund is allowing about 1s. per cubic yard for the work, and this pays about half the expense of keeping the men and their wives, and running the colony financed by the London Unemployed Fund.

Engineering Societies.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday, the 11th inst., Mr. Maurice Wilson, President, in the chair, a paper was read on "Submarine Groyning" by Mr. Gerald Otley Case. The author said that erosion was not confined to the visible shore between high and low water marks, but took place to some extent also in considerable depths of water. He summarised the chief forces at work below low water mark tending to cause erosion as being (1) unbroken or true waves of oscillation; (2) waves during or after breaking; (3) tidal or other currents. He thought the greatest depth of appreciable wave disturbance was about 100 to 150 fathoms. The transporting and eroding power of waves decreased as the depth of water increased. Referring to current action, he stated that the velocity of tidal currents was not as a rule sufficient to enable them to erode coarse material, but that they transported material stirred into suspension by the waves. Currents due to the flow and ebb of the tide were oscillating currents. The conformation of the coast had a most important influence on the action of both waves and currents. He then dealt with the generally-accepted theory of deep sea erosion, which was that in many places erosion of the coast was caused by erosion going on in deep water, which, by undermining the foundation of the shore, caused the shore between high and low water mark to slide into the hollow thus created. That theory was a fallacy; the power of waves and currents to erode decreased as the depth of water increased, and little erosion was going on in deep water. On the contrary, as a whole, the oceans must be slowly filling up, owing to material eroded from the coast and brought down by rivers being gradually spread over the ocean floor. Referring to littoral drift, the author observed that material, in moving round the coast, was gradually worn away by attrition, the smaller particles being slowly carried seaward, fresh material eroded from the land keeping the supply fairly constant. He concluded that waves were the chief cause of littoral drift, and were aided by currents. Adequate protection could generally be obtained by the application of a properly-designed system of groyning, but he insisted on the importance of extending groynes below low water mark. He did not, however, think it necessary or advisable to extend them beyond a depth of about 5 ft. of water. It was most important to build groynes low at first, and raise them as accumulation took place, there being no advantages, but many disadvantages, in building them high in the first instance. After pointing out the disadvantages of using wood and exposed iron in submerged groynes, the author expressed the opinion that ferro-concrete was the material of the future for marine works. The merits of any system of groynes could not be judged by the accumulation brought about in a short time, but by their ability to hold the accumulated material for a considerable period, and by the cost incurred in maintenance.

Books.

The Slide-Rule: A Practical Manual. By CHARLES N. PICKWORTH. Tenth edition. (Manchester: Emmott & Co., Ltd.)

AMONG the various treatises published on the slide-rule, none is more popular than that written by Mr. Pickworth, a fact which is sufficiently proved by the frequent demand for fresh editions. In the present issue no noteworthy changes are to be found in the earlier portion of the work, although this has been carefully revised. It would be still further improved by the inclusion of a table setting out the various special marks, or constants, engraved on slide-rules by different makers, together with full explanations of their exact values and uses. Towards the end of the book more adequate description than formerly is made of rules provided with *log-log* scales, and several recent types of slide-rules are described and illustrated. We find no mention, however, of Col. Anderson's slide-rule, an instrument of great precision clearly deserving notice. The block on p. 100 ought to be replaced by one better drawn and more correctly representing Fuller's calculating rule, which, by the way, is supplied by all instrument-makers and not solely by Mr. Stanley, as implied on p. 101. The section entitled "Slide-rules for Special Calculations" is one which could be amplified with advantage, as, apart from a few words relative to two varieties of calculating wheel, it makes reference to only one slide-rule among the various types now available for specific computations. Owing to successive additions, the category of slide-rules described in the last twenty pages of Mr. Pickworth's treatise has so overgrown the classification originally adopted as to suggest the desirability of entire rearrangement in the next edition, which we hope will be provided with an index as well as the table of contents. In making these hints we are merely accepting the invitation extended by the author, and do not for a moment wish it to be thought that we fail to appreciate the useful character of this treatise, or the successful efforts made by Mr. Pickworth to popularise the slide-rule in the office and workshop.

Practical Pattern-making. By F. W. BARROWS. (London: Crosby Lockwood & Son; 1906.)

IF we omit from consideration some American and one or two English papers, it may safely be said that the technical press of the world is conducted on serious lines, and is fairly free from the writings of misguided people who try to make science and art interesting by treating technical subjects in a way that is meant to be funny. Judging from his colloquial style and the statement that some of the subjects discussed in this treatise have appeared in the *American Machinist* and the *Pattern-Maker*, we assume Mr. Barrows to be either an American, or an Englishman who has lived for some time in the United States. His attempts to make the material in his book "as interesting as possible" are not conspicuously successful. References to "the sty for Farmer Jones' pig," "Johnny's picture of the cow," "the pattern-maker in the *rôle* of Sherlock Holmes," and various other irrelevant allusions, are more calculated to induce the reader to lay the book aside than the "dry reading" which Mr. Barrows looks upon as an objection to technical books as a class. We are glad to find that, as the author gets deeper into the subject, he gradually becomes interested, and, writing sensibly on work he evidently understands, becomes really interesting. The book contains much useful information on pattern-making in general, a detailed description of the materials and tools used by the pattern-maker, and a section devoted to typical patterns in wood and metal. As the examples selected and the general treatment appeal more particularly to mechanical engineers than to architects and builders, the treatise is less suitable for the bulk of our readers than others that could be named. The illustrations are all good, having been prepared exclusively from sectional and other drawings, and, except in places where the author tries to be "interesting," the language used has the merit of being plain, intelligible, and to the point.

National Engineering and Trade Lectures. Vol. II.: "British Progress in Pumps and Pumping Engines." By PHILIP R. BJÖRLING. Vol. III.: "British Progress in Gas Works' Plant and Machinery." By C. E. BRACKENBURY, A.M.Inst.C.E., M.Inst.GasE. London: Archibald Constable & Co., Ltd. 1905.

IN Vol. II. of this work Mr. Björling describes and illustrates several different kinds of pumps and pumping engines made by some of the best-known makers in Great Britain. While containing information which may be useful to Colonial and foreign buyers, this "lecture" has no technical interest, and, in our opinion, is of far less practical value than a well-assorted collection of trade catalogues.

Vol. III., written in a very different style, constitutes an intelligent and interesting review of the plant and machinery employed in gasworks. Commencing with machinery for the reception and handling of raw material, Mr. Brackenbury demonstrates the superior character of the coal and coke storing equipment made in this country and its greater diversity and adaptability than Continental plant for the same purpose. He instances the unique constructional ability displayed by British engineers in the manufacture of stoking machinery, gas-holders, and practically all apparatus incidental to the production of coal and water gas. The concluding chapters on "Gas Appliances" and "By-Products" quite deserve perusal, and the book as a whole is a readable, instructive, and welcome addition to the literature of gas engineering.

Electro-Wiring, Diagrams, and Switchboards. By NEWTON HARRISON, E.E. (London: Crosby Lockwood & Son. 1906.)

THIS book is well printed, many of the diagrams are excellent, and it is notably free from misprints. The author discusses the question with a vigour which often takes the reader by surprise. In the introduction we are told that electric-wiring has now "assumed an importance in the building arts second to none," and, in the preface, that "the pages of this volume will prove of the utmost value to the student, wireman, or contractor." The book deals mainly with American practice, and so the sizes of the wires are given in B and S gauge. Where an English writer would say "earth," or "earthed," the author says "ground" or "grounded." On the other hand, where an American would say "cross," he uses the English "short-circuit." Although the reviewer has had considerable experience in testing three-wire circuits, he is not able to understand the working of the "ground detector" described on p. 211. In his opinion the indications of this detector would be entirely misleading. The descriptions and diagrams of alternating current systems are simple and clear. Young electricians will find some of their difficulties clearly explained, and will appreciate the diagrams explaining the various methods of wiring.

The Encyclopædia of Practical Engineering and Allied Trades. Edited by JOSEPH G. HORNER, A.M.I.Mech.E. Vol. III. London: Virtue & Co.

THIS volume commences with "Boiler Plate" and ends with "Civil Engineering," and, in accordance with the standard set by the compiler, is directed mainly to the instruction of practical men. Most of the articles and paragraphs refer to the various branches of mechanical work, and with the exception of one on Book-keeping—which cannot be considered an engineering subject, and is not discussed in a way helpful to anybody—they are well selected and judiciously treated. Among the articles more particularly interesting to our readers we may mention those entitled "Bore Holes," "Bridge," "Caisson," "Canals," "Carpentry," and "Cement." There is, however, a good deal of information scattered about the volume which may often be drawn upon with advantage in connexion with work performed under architectural specifications, and the present issue quite sustains the favourable opinion we have already expressed concerning the first two volumes of the encyclopædia.

Joiners' Machines and How to Work Them. By T. R. GROOM. (London: William Rider & Son, Ltd.)

IN this small volume the author deals chiefly with some of the machines commonly used in joinery and cabinet-making, his object being to give serviceable information to those engaged in such branches of work rather than to the experienced mill-owner or operative. The author writes from experience gained as a practical sawyer and machinist, and his book contains a good many useful hints as to the management of various simple types of wood-working machines.

Society of Engineers: Transactions for 1905. Edited by PERRY F. NURSEY, Secretary. (London: E. & F. N. Spon, Ltd. 1906.)

MOST of the papers printed in this volume of *Transactions* have already been noticed in our columns. The subjects discussed are of more than ordinary interest, a circumstance which may be responsible for the fact that two at least of the authors have read very similar papers before other engineering societies, or have availed themselves of other means of making known their views and experience. "The Transport Possibilities of

our Inland Navigable Waterways," by Mr. B. H. Thwaite; "The Parade Extension Works at Bridlington," by Mr. E. R. Matthews; "The Improvement of London Traffic," by Messrs. Meik and Beer; and "The Metallic Preservation and Ornamentation of Iron and Steel Surfaces," by Mr. S. Cowper-Coles, are the most noteworthy contributions in the volume, and their value is considerably increased by the numerous drawings and diagrams reproduced as illustrations.

BOOK RECEIVED.

ELECTRICITY IN HOUSES AND WORKSHOPS. By Sydney F. Walker. Fourth Edition. (Whittaker & Co. 5s.)

Fifty Years Ago.

FROM THE *Builder* OF JUNE 14, 1856.

INSUFFICIENT SCAFFOLDING: TARRANT *v.* WEBB.

IN the Court of Common Pleas, at Westminster, on the 3rd inst., this case was tried. The defendant is a house decorator and painter, and in October last he was employed to do some work in the interior of the Carlton Clubhouse. For the purpose of performing his contract, a scaffold was erected (according to the case of the plaintiff) under the defendant's directions, in the hall of that building. The plaintiff, who was employed on the same work with several other men, mounted this scaffold on October 4 last: a portion of it gave way, and he was precipitated to the ground, and seriously injured, and he now sought to recover damages from the defendant, who, as he alleged, had built the scaffold in an unsafe and insufficient manner.

The defence was, that even if Mr. Webb had erected the scaffold, he was not liable for any accident which might happen to the plaintiff, who, if he saw that the structure was faulty, need not have gone on it.

The jury eventually found a verdict for the plaintiff—damages, 25*l*.

Illustrations.

SCULPTURE FROM THE PARIS SALON.

THE two groups of sculpture here illustrated were among the most prominent exhibits in the sculpture hall of the Paris Salon this year, and were referred to in our article on the Salon some weeks since.

The "Nouvelle Muse," by M. Guilloux, appears to represent the Muse of music, or he may merely mean to represent the modern spirit of poetry; it would lend itself to either interpretation. It will be observed how finely the two figures are grouped so as to make a pyramidal composition.

M. Peyre's "Offrande à Vénus" sufficiently explains itself.

NEW CHAPEL FOR THE COMMUNITY OF THE RESURRECTION, MIRFIELD, YORKS.

ON the top of a commanding eminence, which on one side slopes away down into the valley below, the site offers great opportunities for effective treatment.

The chapel is to be built of the local stone, and a quarry exists in the grounds of the community. The external bands are formed by the employment of alternate ashlar and rubble work.

Internally the local stone will be used, also various other kinds, the roof being formed with stone ribs and coke breeze concrete coloured on the under face. The height to the apex of the vaulting is 64 ft., and to the top of the columns 50 ft. The columns which support the lantern tower are so arranged as to form a sort of baldachino over the high altar.

The screen is of marble and metal.

Two stairways on either side of the nave with two flights of twelve steps each lead on to the vestries' level, and a further flight of twelve steps leads to the crypt. This is a spacious, vaulted chamber about 18 ft. in height, 98 ft. in length, and an average width of 45 ft.

Over the walls of the crypt on the external face and leading round the lady chapel from each of the octagon chapels is an outside passage. The west end will be connected to the house on the one side and to the college on the other by a low cloister in crescent form. The architect is Mr. A. H. Skipworth.

SOME SAN FRANCISCO BUILDINGS BEFORE THE FIRE.

THE first of these four illustrations is of what may be called a tragic practical interest, for it forms an illustration of the danger of wooden buildings in a city liable to earthquakes and fires. It was the rapid conflagration of these wooden buildings which led the fire up to the higher-class residential quarter of the city, which might otherwise have escaped.

The effects of earthquake and fire on the City Hall and Leland Stanford University gateway are shown in the subjoined reproductions from photographs taken after the fire. The Mint is the building previously mentioned in a letter in our columns, which withstood the earthquake without damage; but we cannot help thinking that there must have been some special cause for this immunity other than the mere thickness and solidity of the walls.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Metropolitan Asylums Board was held on Saturday last week at the offices, Victoria-embankment.

Darenth Asylum.—The Asylums Committee submitted a report dealing with the proposal to construct new workshops and a fire-station at this Institution. The Local Government Board having asked for further information in regard to the fire-station, the Committee recommended that the report of the Engineer-in-Chief should be forwarded to that authority. The Committee's recommendation was agreed to. The total cost of the scheme is estimated at 3,500*l*.

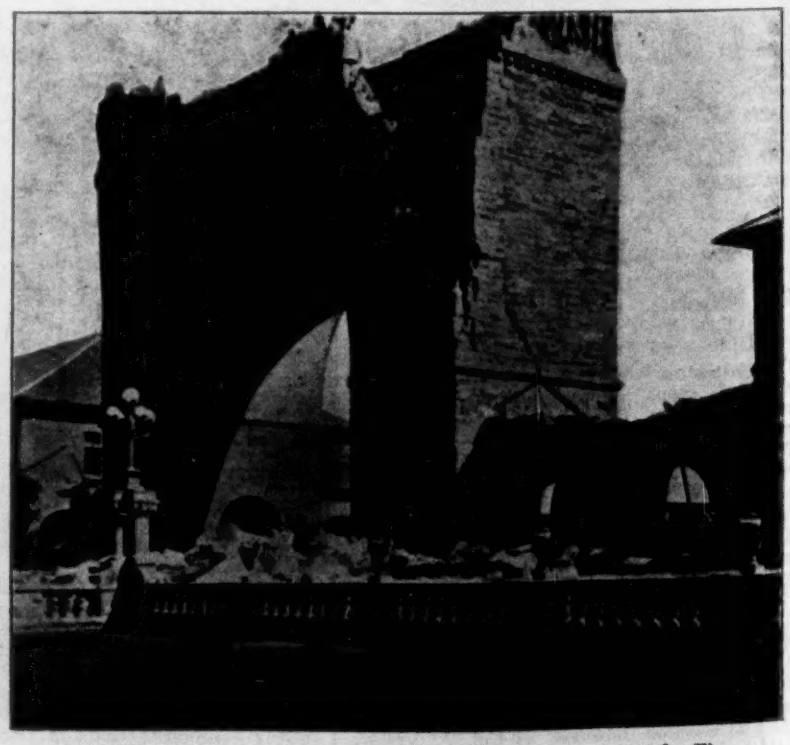
East Cliff House.—The same Committee submitted a report on the proposal to erect a new building for the laundry staff at this Institution. The Works Committee were instructed to obtain tenders for the work. The cost is estimated at 690*l*., but the Local Government Board have suggested that the work could be carried out for 500*l*.

Small Pox Hospitals.—On the recommendation of the Hospitals Committee the question of providing additional accommodation for cattle at the Board's small-pox hospitals was referred to the Works Committee to be dealt with.

Bacteriological Laboratories.—The plans prepared by Messrs. T. W. Aldwinckle & Son for the provision of diphtheria antitoxin and bacteriological laboratories on the Board's property at Peckham Rye were adopted, and ordered to be forwarded to the Local Government Board.

WHITEFRIARGATE BRIDGE, HULL.—At a recent meeting of the Hull Corporation Works Committee the Whitefriargate Bridge Sub-Committee reported that the Mayor had seen Mr. Newell, with the City Engineer, with reference to the suggestion that a spare shaft should be provided for Whitefriargate Bridge, and that Mr. Newell stated that he could not advise the North-Eastern Railway Company to provide one. The City Engineer also informed the sub-committee that he had written to the engineer in charge of the Tower Bridge inquiring whether any spare main shaft for the bridge was provided, and that he had received a negative reply. In the opinion of the City Engineer it would be unreasonable to expect a spare shaft to be provided for the new Whitefriargate Bridge. The sub-committee thereupon resolved that in their opinion it was no part of the duty of the Corporation to provide a spare shaft for the Whitefriargate Bridge, and that there is no sufficient reason for asking the North-Eastern Railway Company to do so.

City Hall, San Francisco: After the Fire.



Arch, Leland Stanford University, San Francisco: After the Fire.

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"FRANDE À VÉNUS." BY M. PEYRE.

INK PHOTO SPRAGUE & C° LT° 4 & 5 EAST HARDING STREET FETTER LANE E.C.

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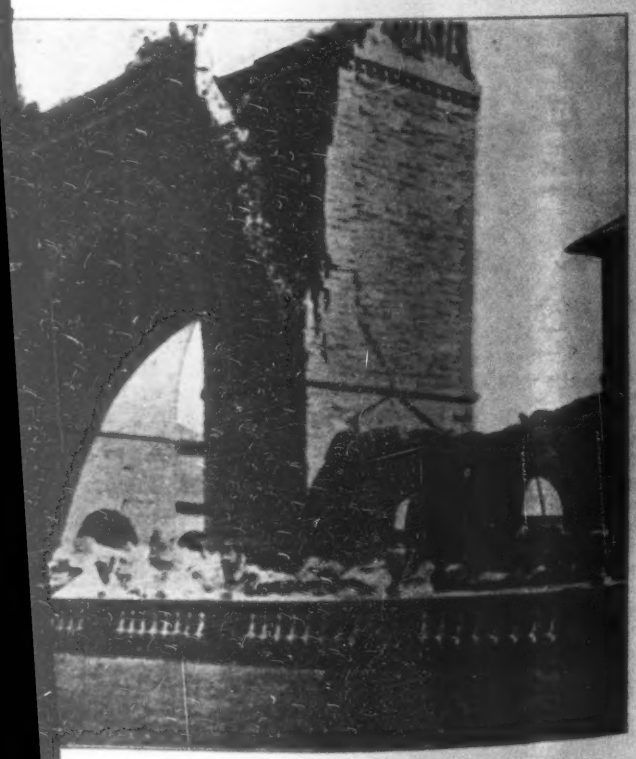

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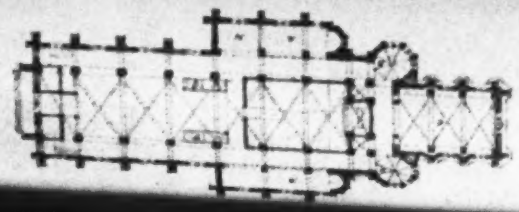
SCULPTURE AT THE PARIS SALON.



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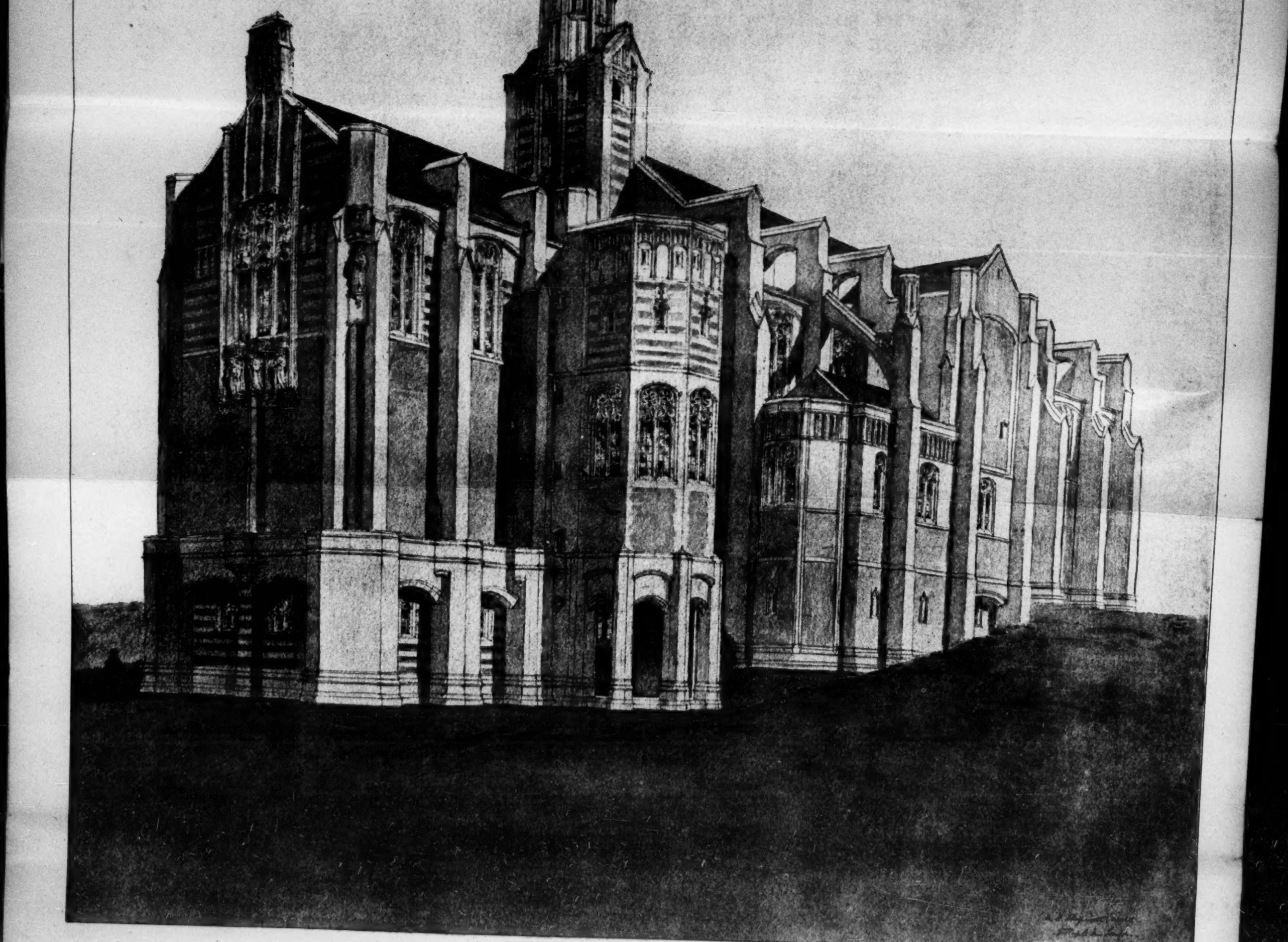

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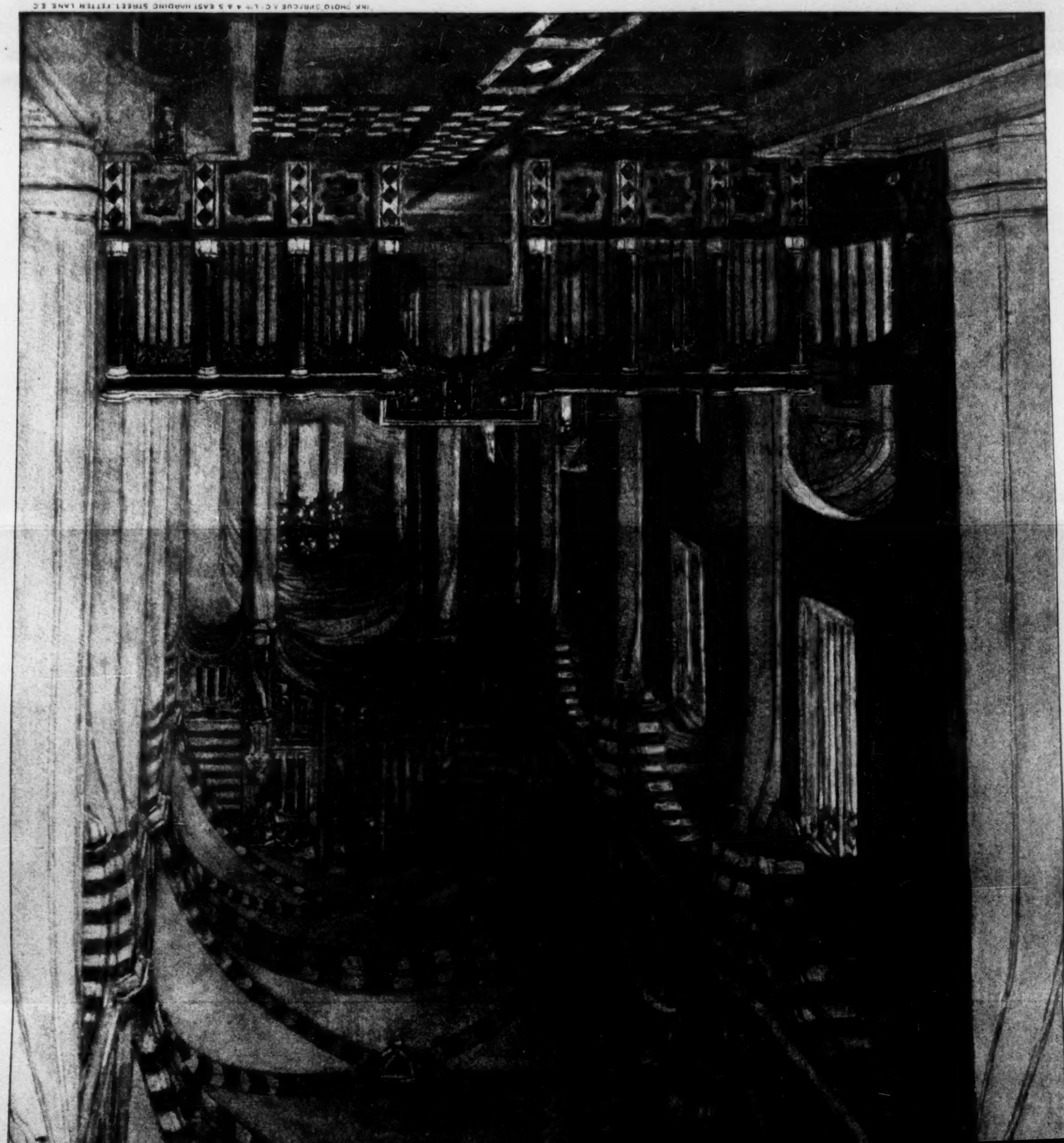

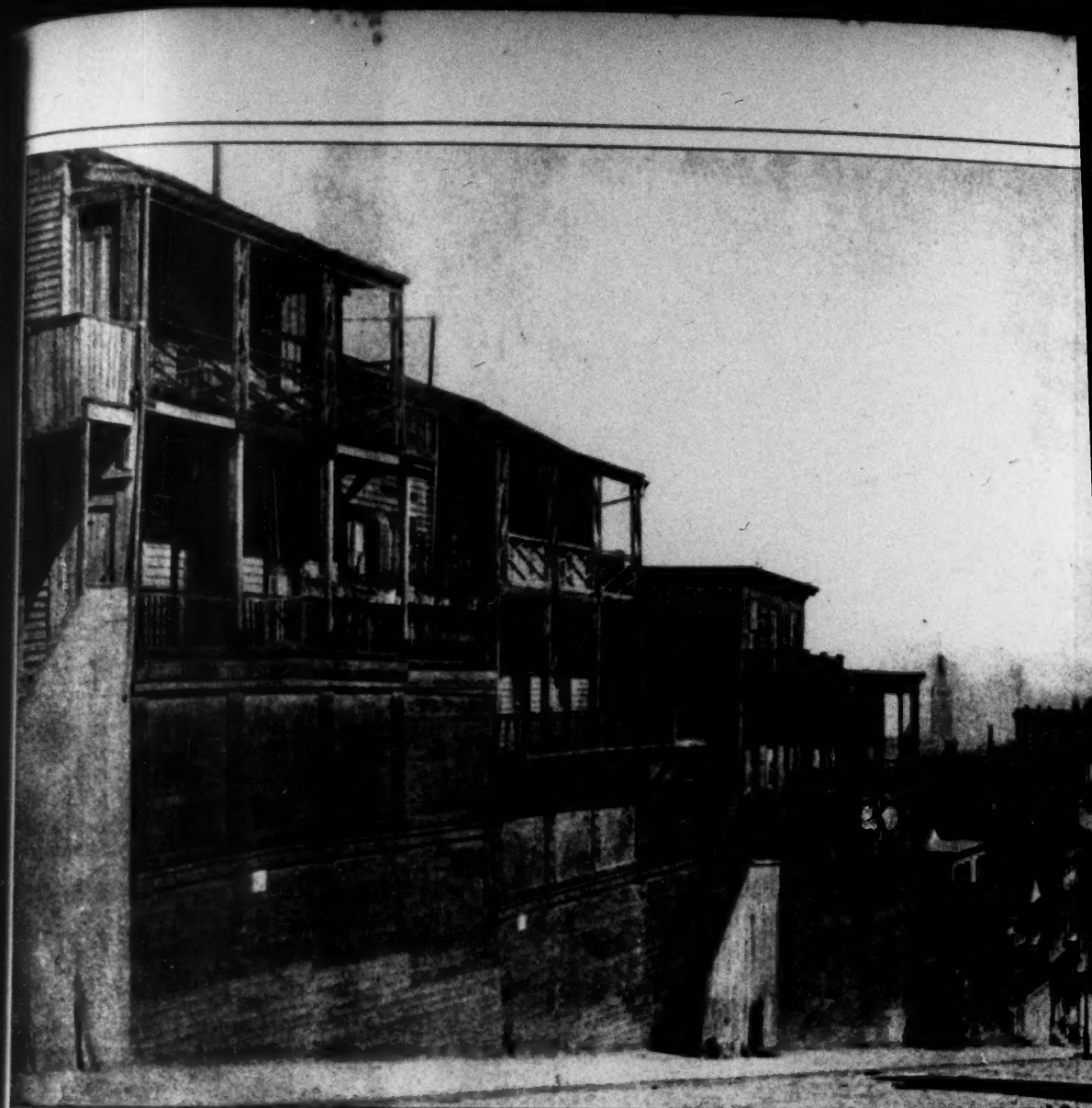

Tottering Wooden Shanties on the Nob Hill Grade, forming the Fuse which led the Fire up the Mansions on the Summit.

City Hall, covering Five Acres. Cost £1,600,000.

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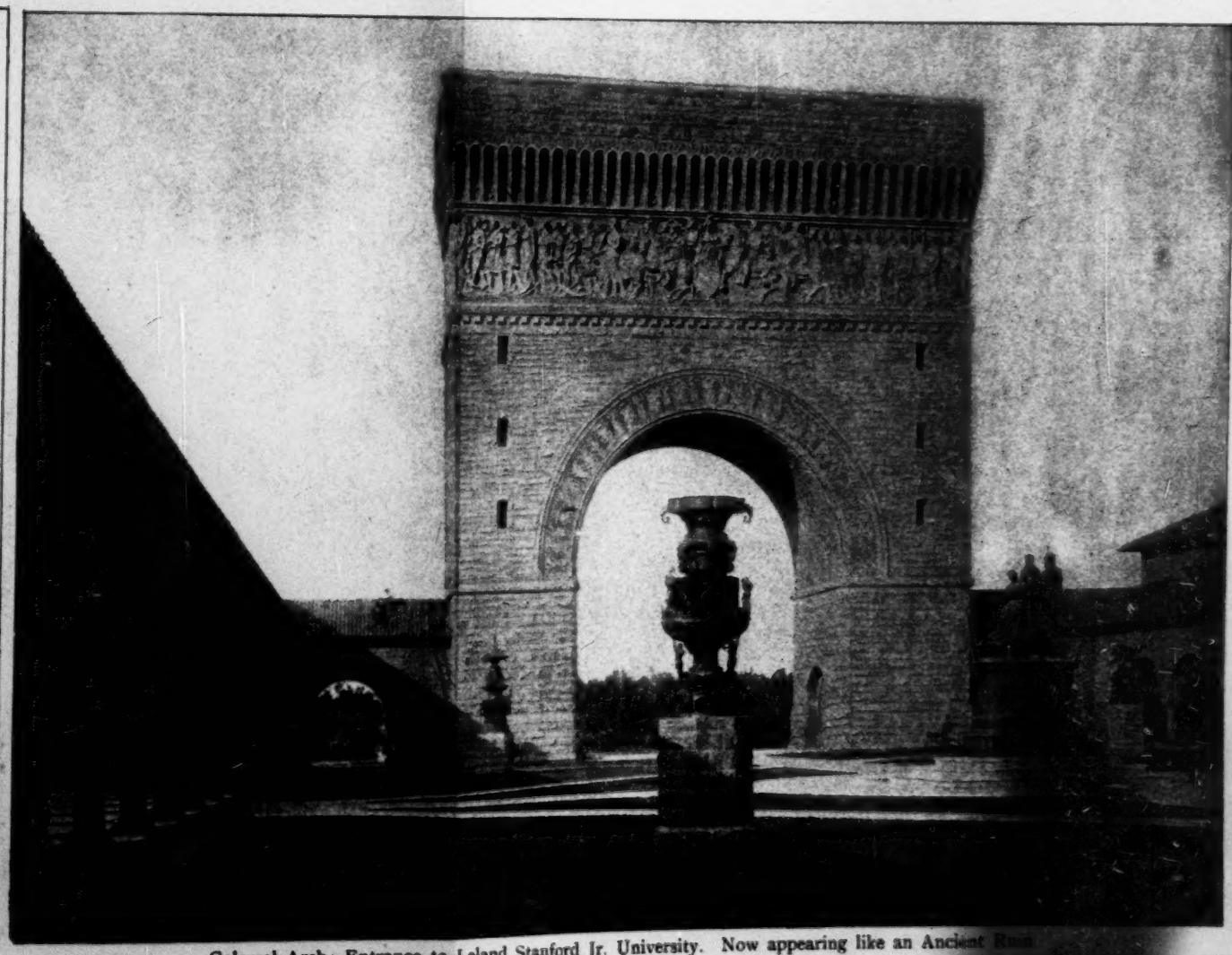
U.S. Mint. Massive Stone-built Building: Survived unscathed.



Colossal Arch: Entrance to Leland Stanford Jr. University. Now appearing like an Ancient Ruin

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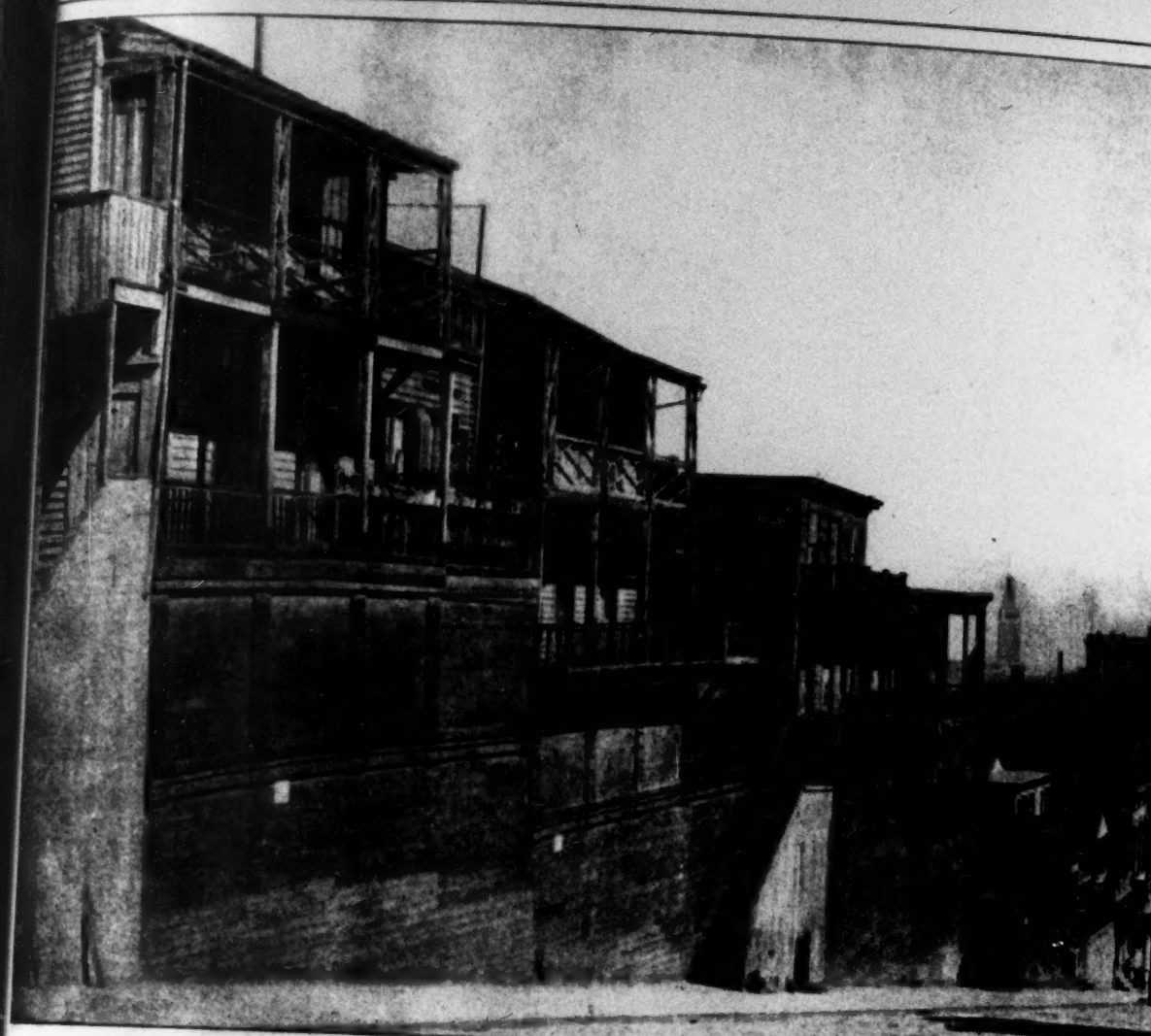
SOME SAN FRANCISCO BUILDINGS BEFORE THE FIRE



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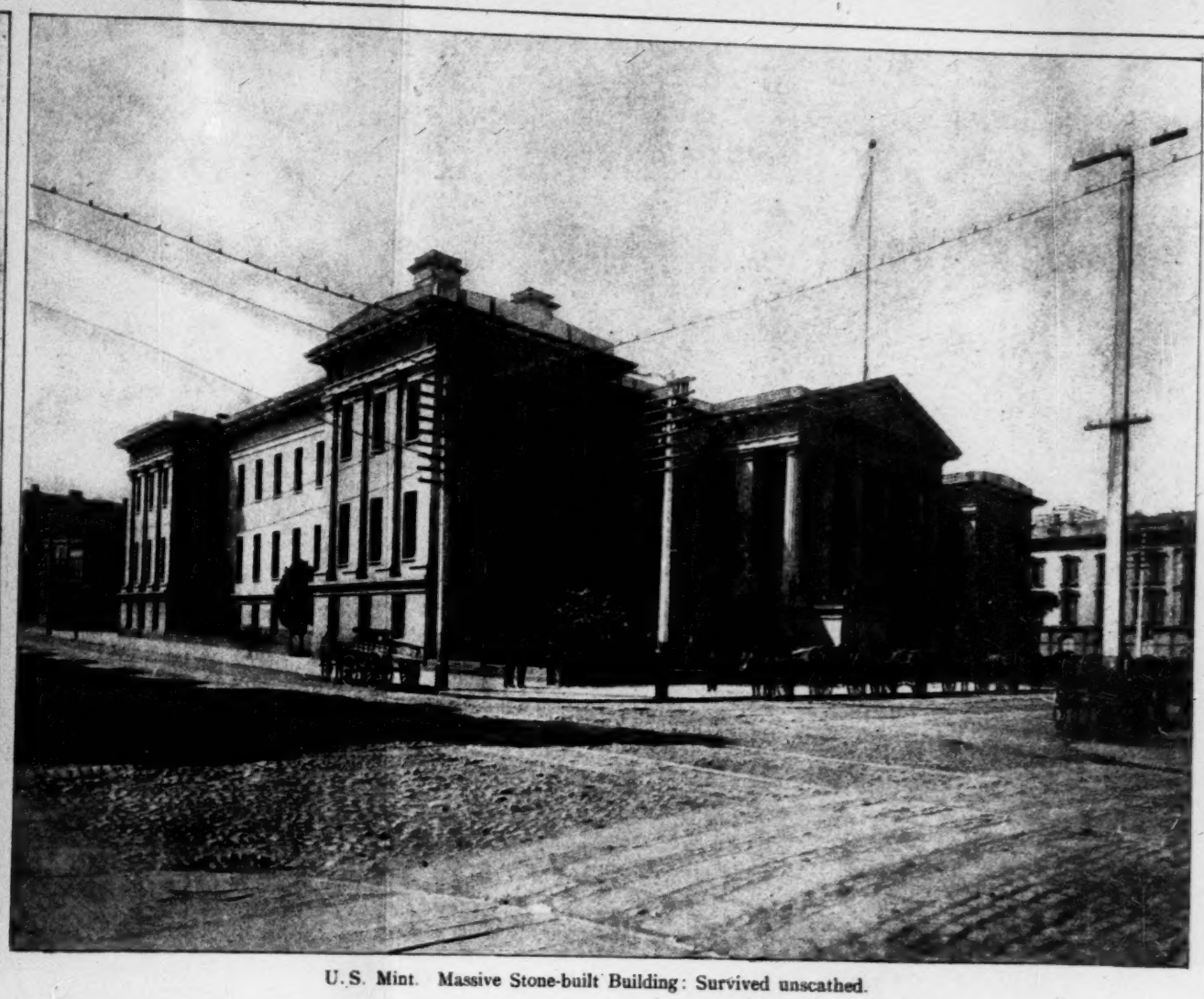

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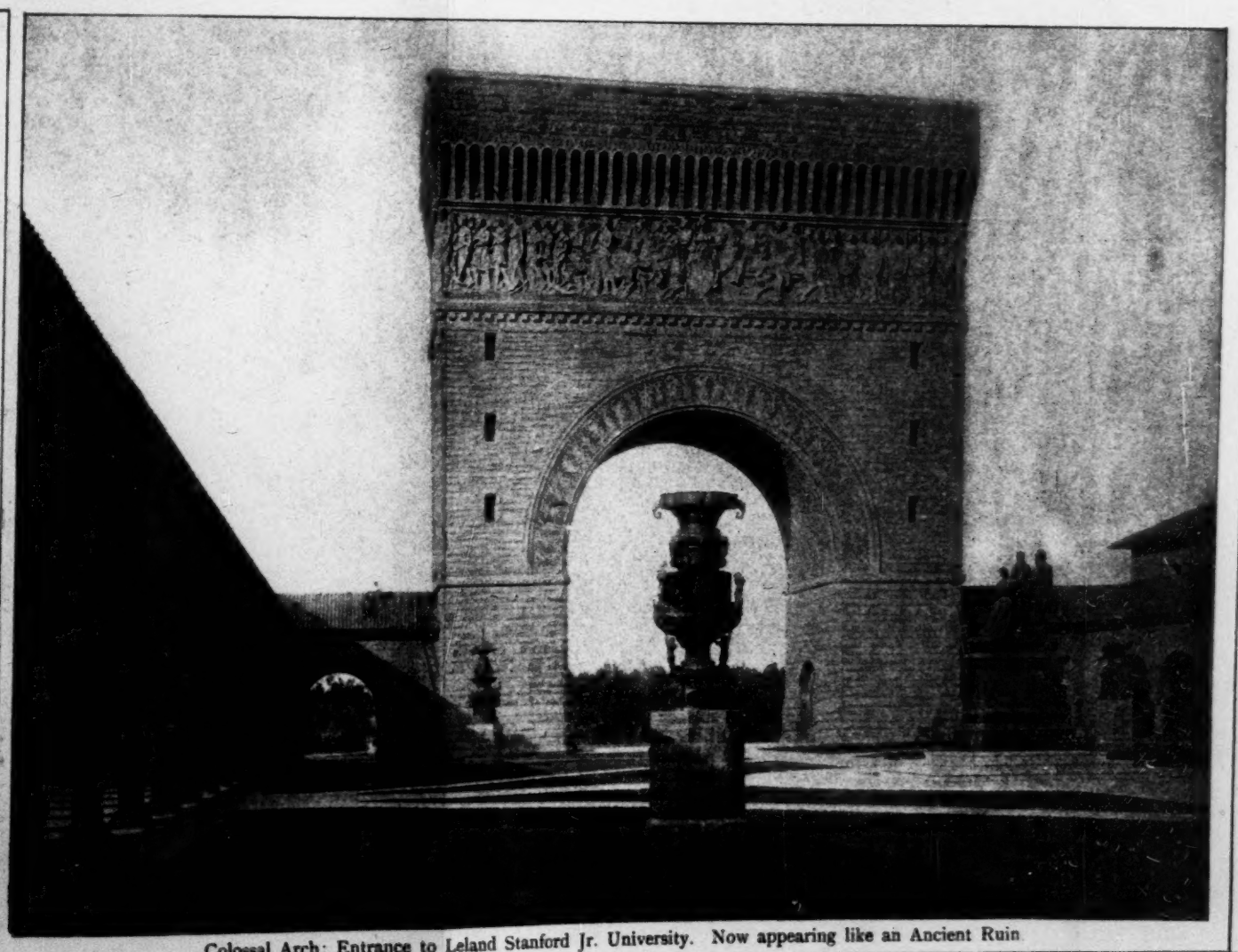

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INK-PHOTO. SPRAGUE & C° LT° 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

SOME SAN FRANCISCO BUILDINGS BEFORE THE FIRE.

The Student's Column.

SOME MATHEMATICAL METHODS AND USEFUL DATA FOR ARCHITECTS.—XXIII.

THE SLIDE-RULE IN TECHNICAL CALCULATIONS (*continued*).

SOME other modes of applying the slide-rule to technical calculations still remain to be mentioned, and, as before, the reader is referred to the rule illustrated in Fig. 16.

Cubes.—To find the cube of any number by the slide-rule it is quite feasible to proceed by successive multiplications on one pair of scales, but a more expeditious method is to bring into play the automatic squaring process effected by the shorter graduations of scales A and B.

Rule (1).—To find the cube of any number from $\sqrt[3]{1}$ up to $\sqrt[3]{100}$ (= 4·6415) on D, set the left-hand index of C to the number on D, and opposite the given number on the left-hand half of scale B read the required cube on scale A.

To find the cube of any number from $\sqrt[3]{100}$ up to $\sqrt[3]{1000}$ (= 10) on D, set the right-hand index of C to the number on D, and opposite the given number on the left-hand half of scale B read the required cube on scale A.

The employment of the right-hand index is necessary for numbers above $\sqrt[3]{100}$, because the movement of the left-hand index beyond 4·6415 on D causes the numbers of scale B corresponding to the remaining values on scale D to pass beyond the limit of scale A. Therefore, as explained in Article XIX., we continue the process by using the right-hand index of scale C, regarding the values marked on the left-hand half of scale A as having been multiplied by 100, so that 1 represents 100, 2 represents 200, and so on.

In this way we are enabled to find the cubes of all numbers up to 10, and by considering the figures and marks on the scales to have been multiplied by positive and negative powers of 10 as required, all numbers, mixed numbers, and decimal fractions can be cubed. For the correct positions of multiples and sub-multiples of numbers on the upper scales, see tables XVII. and XVIII.

The number of digits to the left of the decimal place in the cube of any whole or mixed number is determined as stated below, where N = number of digits in the cube, and n = the number of digits in the given number.

Rule (2):—

(*a*) For cubes read on L.H. half of A, slide projecting to the right hand: $N = 3n - 2$.
(*b*) For cubes read on R.H. half of A, slide projecting to the right hand: $N = 3n - 1$.
(*c*) For cubes read on L.H. half of A, slide projecting to the left hand: $N = 3n$.

The number of ciphers immediately to the right of the decimal point in the cube of any decimal fraction is determined as stated below, where C = the number of ciphers in the cube and c = the number of ciphers in the given decimal fraction.

Rule (3):—

(*a*) For cubes read on L.H. half of A, slide projecting to the right hand: $C = 3c + 2$.
(*b*) For cubes read on R.H. half of A, slide projecting to the right hand: $C = 3c + 1$.
(*c*) For cubes read on L.H. half of A, slide projecting to the left hand: $C = 3c$.

Example (1): Find the cube of 2·1.

Set L.H. index of C to 2·1 on D, and over 2·1 on L.H. of B read 9·26 on the L.H. half of A. As the slide projects to the right the number of figures in the cube by Rule (2) *a* is $(3 \times 1) - 2 = 1$. Therefore, the cube is taken at 9·26, the exact value being 9·261.

Example (2): Find the cube of 39·6.

Set L.H. index of C to 39·6 on D, and over 39·6 on L.H. of B read 621 on the R.H. half of A. As the slide projects to the right the number of figures by Rule (2) *b* is $(3 \times 2) - 1 = 5$. Therefore, the cube is taken at 62,100, the exact value being 62099·136.

Example (3): Find the cube of 8·2.

Set R.H. index of C to 82 on D, and over 8·2 on L.H. of B read 551 on the L.H. half of A. As the slide projects to the left the number of figures by Rule (2) *c* is $(3 \times 1) = 3$. Therefore, the cube is taken at 551, the exact value being 551·368.

Example (4): Find the cube of 0·082.

The required figures being the same as found in Example (3), we have only to settle the number of ciphers following the decimal point in accordance with Rule (3) *c* thus: $(3 \times 1) = 3$, and the cube is 0·000551.

Cube Root.—Two methods are available for finding cube roots by the aid of the slide-rule.

Rule (4.)—Set the cursor to the given number on scale A, and move the slide to the right hand or the left hand, until the number found on the left-hand half of scale B under the cursor is equivalent to the number simultaneously found on scale D under the L.H. or R.H. index of scale C. The value thus concurrently ascertained represents the cube root, or the significant figures of the cube root, of the given number.

In applying this rule to numbers containing one, two, and three figures respectively, it is necessary to take the numbers on the appropriate parts of scale A, to move the slide in the proper direction, and always to use the left-hand half of scale B in conjunction with scale A. Thus:

Take 1-figure numbers on	L.H.	of A,	move slide to	R.H.
„ 2	„	R.H. „ A,	„	to R.H.
„ 3	„	L.H. „ A,	„	to L.H.

Example (5): Find the cube roots of (1)8, (2)80, and (3)800.

(1) Set cursor to 8 on L.H. of A, move slide to R.H. and find $2 = \sqrt[3]{8}$.
(2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $4{\cdot}3 = \sqrt[3]{80}$.
(3) Set cursor to 8 on L.H. of A, move slide to L.H. and find $9{\cdot}28 = \sqrt[3]{800}$.

In dealing with numbers containing more than three figures the numbers must be pointed off into groups of three as in evolution by arithmetic (see Article XI., page 325). Having done this, the number of figures in the first group indicates the part of scale A on which any given number is to be taken, and the direction in which the slide is to be moved.

Rule (5).—In any cube root there is one digit for each group of three figures into which the given number has been pointed off, and one digit for the first group, whether this includes one, two, or three figures.

In applying Rule (4) to decimal fractions having two, one, and no ciphers immediately after the decimal point, the procedure is as follows:—

Take 0-cipher fractions on	L.H.	of A,	move slide to	L.H.
„ 1-cipher „	R.H.	„ A,	„	R.H.
„ 2-cipher „	L.H.	„ A,	„	R.H.

Example (6): Find the cube roots of (1)0·008, (2)0·08, and (3)0·8. These numbers must be written as 0·008, 0·080, and 0·800.

(1) Set cursor to 8 on L.H. of A, move slide to R.H. and find $0{\cdot}2 = \sqrt[3]{0{\cdot}008}$.
(2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $0{\cdot}43 = \sqrt[3]{0{\cdot}08}$.
(3) Set cursor to 8 on L.H. of A, move slide to L.H. and find $0{\cdot}928 = \sqrt[3]{0{\cdot}8}$.

To deal with decimal fractions having more than two ciphers immediately after the decimal point, point off the fraction towards the right into groups of three figures, and add any ciphers necessary at the end of the last period, as in arithmetic (see Article XI., page 325). Then the position of the first significant figure in its group indicates which part of scale A must be used, and the direction in which the slide is to be moved.

Rule (6).—In the cube root of any decimal fraction there is one cipher immediately after the decimal point for every group consisting entirely of ciphers into which the given fraction has been pointed off.

Example (7): Find the cube roots of (1)0·0008 and (2)0·000000008.

Pointing off the numbers and appending the necessary ciphers we have 0·000,800 and 0·000,000,080.

(1) Set cursor to 8 on L.H. of A, move slide to L.H. and find $0{\cdot}0928 = \sqrt[3]{0{\cdot}0008}$.
(2) Set cursor to 8 on R.H. of A, move slide to R.H. and find $0{\cdot}0043 = \sqrt[3]{0{\cdot}000000008}$.

Cube roots can also be found by the use of the inverted slide and scale B^1, *i.e.*, scale B inverted. When the operator has learned to read figures upside down with facility this method will be found more convenient than that discussed above.

Rule 7.—Set the left-hand or the right-hand index of the inverted slide to the given number on scale A, and look along scales B^1 and D for two coincident numbers. When found, these represent the required cube root or the significant figures of the root of the given number.

As in the previously described method, it is necessary to take the given number on the proper part of scale A, to use the proper index of the slide, and always to use the right-hand half of scale B^1 (that is the left-hand half of scale B) in conjunction with scale D as follows:

Take 1-figure numbers on	L.H.	of A,	use	R.H. index.
„ 2 „	R.H.	„ A,	„	R.H. „
„ 3 „	L.H.	„ A,	„	L.H. „

The method of pointing off the digits of numbers whose cube roots are required, and the methods of determining the number of digits or ciphers in the cube roots found are the same as those already explained in Rules (4) to (6).

Example (8): Find the cube root of (1)6,000, (2)60,000, and (3)600,000.

(1) Set R.H. index of slide to 6 on L.H. of A, and find 1817 on R.H. of B^1 coincident with 1817 on D. Then $18{\cdot}17 = \sqrt[3]{6{,}000}$.
(2) Set R.H. index of slide to 6 on R.H. of A, and find 391 on R.H. of B^1 coincident with 391 on D. Then $39{\cdot}1 = \sqrt[3]{60{,}000}$.
(3) Set L.H. index of slide to 6 on L.H. of A, and find 843 on R.H. of B^1 coincident with 843 on D. Then $84{\cdot}3 = \sqrt[3]{600{,}000}$.

In applying Rule (7) to decimal fractions having two, one, or no ciphers immediately after the decimal point, the procedure is as follows:—

Take 0-cipher fractions on	L.H.	of A,	use	L.H. index.
„ 1-cipher „	R.H.	„ A,	„	R.H. „
„ 2-cipher „	L.H.	„ A,	„	R.H. „

The same procedure is also applicable, after a decimal fraction has been pointed off, to the group containing the first significant figure.

Example (9): Find the cube roots of (1)0·000006, (2)0·00006, and (3)0·0006. These numbers must be pointed off thus: 0·000,006, 0·000,060, and 0·000,600.

(1) Set R.H. index of slide to 6 on L.H. of A, and find 1817 as before. Then $0{\cdot}01817 = \sqrt[3]{0{\cdot}000006}$.
(2) Set R.H. index of slide to 6 on R.H. of A, and find 391 as before. Then $0{\cdot}0391 = \sqrt[3]{0{\cdot}00006}$.
(3) Set L.H. index of slide to 6 on L.H. of A, and find 843 as before. Then $0{\cdot}0843 = \sqrt[3]{0{\cdot}0006}$.

Higher Powers and Roots.

Fourth Powers—

Rule (8).—Set the right-hand or the left-hand index of scale C to the given number on scale D, and opposite the given number on scale C read the fourth power on scale A.

It should be observed that only one half of scale D can be used with the L.H. index of the slide, and that to use the other half the R.H. index must be employed.

Rule (9).—Let N = the number of digits in any fourth power, and n = the number of digits in the given number. Then calculate the number of digits as below:—

Power Read on Scale A.	Index.	Number of Figures in Power.
L.H. half ..	L.H. ..	$N = 4n - 3$
R.H. „ ..	L.H. ..	$N = 4n - 2$
L.H. „ ..	R.H. ..	$N = 4n - 1$
R.H. „ ..	R.H. ..	$N = 4n$

With suitable modification this rule is also applicable to decimal fractions.

Example (10): Find the fourth powers of (1)1·19, (2)21·15, (3)376·5, and (4)6·69.

(1) Set the L.H. index of C to 119 on D, and over 119 on C read 2 on L.H. of A. The number of figures = $(4 \times 1) - 3 = 1$, $\therefore 1{\cdot}19^4 = 2$.
(2) Set the L.H. index of C to 2115 on D, and over 2115 on C read 2 on R.H. of A. The number of figures = $(4 \times 2) - 2 = 6$, $\therefore 21{\cdot}15^4 = 200{,}000$.
(3) Set the R.H. index of C to 376·5 on D, and over 376·5 on C read 2 on L.H. of A. The number of figures = $(4 \times 3) - 1 = 11$, $\therefore 376{\cdot}5^4 = 20{,}000{,}000{,}000$.
(4) Set the R.H. index of C to 669 on D, and over 669 on C read 2 on R.H. of A. The number of figures = $(4 \times 1) = 4$, $\therefore 6{\cdot}69^4 = 2{,}000$.

Fourth Roots.—Fourth roots may be extracted by a reversal of the process described above.

Rule (10).—Set the cursor to the given number on scale A, and move the slide to the right hand or the left hand until the number found under the cursor on scale C is equivalent to the number simultaneously found on scale D under the L.H. or R.H. index of scale C. The

value thus concurrently ascertained represents the fourth root, or the significant figures of the fourth root of the given number.

It is necessary to take the numbers at the proper part of scale A, and to use the proper index of the slide. When the given number has been pointed off into groups of four figures, the first group in the case of a whole number, and the group containing the first significant figure in the case of a decimal fraction, read in connexion with the subjoined table, indicates at once which half of scale A and which index of the slide are to be used.

Number taken on A.	Index on C.	Readings on A.	
		Whole Numbers.	Decimal Fractions.
L.H. half	L.H.	1 to 9+	·0001 to ·0009+
R.H. ,,	L.H.	10 to 99+	·001 to ·009+
L.H. ,,	R.H.	100 to 999+	·01 to ·09+
R.H. ,,	R.H.	1000 to 9999+	·1 to ·9+

Rule (11).—The number of digits in the fourth root of any whole number corresponds with the number of groups obtained by pointing off the digits in fours, and the number of ciphers immediately after the decimal point in the fourth root of any decimal fraction corresponds with the number of groups, which, after pointing off, are seen to consist wholly of ciphers.

Example (11): Find the fourth roots of (1)8·35, (2)83·5, (3)835, (4)8350.

(1) Set the cursor to 835 on L.H. of A, and using L.H. index of slide, find 17 on C under cursor and 17 on D below the index of C. Then, as the given number contains part of only one group of four digits, $1·7 = \sqrt[4]{8·35}$.

(2) Set cursor to 835 on R.H. half of A, and using L.H. index of slide, find 302 on C under cursor and 302 on D below the index of C. Then, as the given number contains part of only one group of four digits, $3·02 = \sqrt[4]{83·5}$.

(3) Set cursor to 835 on L.H. half of A, and using R.H. index of slide, find 5375 on C under cursor and 5375 on D below the index of C. Then, as the given number contains part of only one group of four digits, $5·374 = \sqrt[4]{835}$.

(4) Set cursor to 8350 on R.H. half of A, and using R.H. index of slide, find 956 on C under cursor, and 956 on scale D below the index of C. Then, as the given number contains only one group of four digits, $9·56 = \sqrt[4]{8350}$.

Example (12): Find the fourth roots of (1)0·0000000835, (2)0·00835, (3)0·00000335, and (4)0·0000835.

These numbers must be pointed off thus: 0·0000,0008,3500, 0·0083,5000, 0·0000,0835, and 0·0000,8350.

(1) Find 17, as before. Then, as the given number contains one group entirely of ciphers, $0·017 = \sqrt[4]{0·0000000835}$.

(2) Find 302, as before. Then, as the given number contains no group entirely of ciphers, $0·302 = \sqrt[4]{0·00835}$.

(3) Find 5375, as before. Then, as the given number contains one group entirely of ciphers, $0·05375 = \sqrt[4]{0·000000835}$.

(4) Find 956, as before. Then, as the given number contains one group entirely of ciphers, $0·0956 = \sqrt[4]{0·00008350}$.

By noticing exactly what happens when operating the slide-rule in the foregoing calculations, the reader will find that after the proper position of any given number has been settled on scale A, the quickest way of finding the fourth root is to extract the square root of the square root as follows:

Rule (12).—Set the cursor to the given number on scale A, read the square root on scale D, set the index of B to the value of the square root on scale A and read the fourth root on scale D below the index of scale C.

WORSHIP-STREET POLICE-COURT.—Under an order in Council the police-court in Worship-street has been closed, and the business of the court is transferred to new buildings in Old-street, St. Luke's, which will serve for the locality by name of the Old-street Police-court. In Rocque's map of about 1755 the east end of the present Worship-street appears as Hog-lane, where lived the actor, Gabriel Spencer, whom Ben Jonson killed in a duel in the fields at Hoxton.

Obituary.

MR. SCRIVENER.—The death, at his residence, The Cedars, Newcastle-under-Lyme, is announced of Mr. Edward Elvine Scrivener, in his sixty-eighth year. Mr. Scrivener was senior member of the firm of Messrs. R. Scrivener & Sons, of Howard-place, Hanley, architects, surveyors, and valuers. His partners were Mr. A. Scrivener and Mr. E. D. M. Scrivener; in May last the firm dissolved partnership in so far as regards Mr. E. D. M. Scrivener. Of the more principal architectural works carried out by Mr. Scrivener and his firm we may mention the enlargement of the schools at Atherstone; school buildings for Highley School Board, Salop; the new schools in Queen-street, Fenton, for the Stoke-upon-Trent Urban District School Board, for 660 boys and girls, 1897, and in 1902 more school buildings at Fenton; a mixed school for 470 children in Princes-road, and one for the deaf and dumb at Penkhull, Staffs.; the new church for St. Jude's parish, Hanley, for a congregation of 850 persons, at a cost, with the site, of some 10,000*l.*, 1897-8; the Roman Catholic Church and schools for 354 children in Hall-street, Burslem, 1897-8; the laying-out of Fenton Park estate, and Dix's brewery, Hanley; new premises in Foundry-street, Hanley, for the proprietors of the *Staffordshire Sentinel*, comprising offices, a publishing-room, and a large printing press room to accommodate six electrically driven machines; and, in Lamb-street, premises for Messrs. Huntbach & Co.; the restoration, six years ago, of the parish church of St. Lawrence, Ansley, near Atherstone, in Warwickshire; the infirmary and sick wards at Denstone College, Hanley, 1901; extension of mill works at Hanley, for Messrs. C. Leese & Sons; premises at Burslem, and enlargement of Dalehall Manufactory, Hanley, for Messrs. Keeling & Co.; shops and warehouse in High-street, Stoke-upon-Trent, for Mr. J. H. Irwin, and, for Messrs. W. Kirkham & Sons, a slip-house and workshops, Stoke-upon-Trent; schools for 548 children at Tunstall; St. James's rectory-house, Longton, Staffs. (a very recent work of the firm); and schools in Shelton New-road, and the cookery classrooms, etc., at Harpfield, for the School Board of Stoke-upon-Trent. Mr. Scrivener was architect to the School Board for Hanley and their successors, the Hanley Education Committee; in that capacity he and his firm made the plans and designs for many board schools, amongst them being those in Cauldon-road, 1896; Great York-street; Northwood Schools; a junior mixed school; the New Grove Schools for 1,000 children; and, in 1905, the extensions of the Municipal Secondary School. Mr. Scrivener was valuer to the Board of Guardians for Stoke-upon-Trent, and five years ago was appointed a Justice of the Peace for the borough of Hanley.

MR. W. PATTINSON.—Mr. William Pattinson, head of the firm of Messrs. W. Pattinson & Sons, contractors, Ruskington, near Sleaford, has just died in his seventy-third year. He was the first chairman of the Ruskington Urban Council.

General Building News.

ST. AUGUSTINE'S CHURCH, DERBY.—A further advance towards the completion of this church has been made by the erection of a south aisle, which will provide about 200 additional sittings. The work has been carried out under the direction of Messrs. Naylor & Sale, architects, of Derby, who prepared the original design, and the builder was Mr. Henry Chattle.

CHURCH, GARRISTOWN, IRELAND.—The new church at Garristown has just been dedicated by his Grace the Archbishop of Dublin. The new church is built in the Gothic style. It consists of a nave 90 ft. by 30 ft., with a diagonal apse 20 ft. by 18 ft. The walls are built of local limestone from Mr. Mangan's quarries, lined on the inside with brick. The chiselled dressings to windows, doors, plinths, buttress-weatherings, etc., are from the Milverton quarries, Skerries. The chancel floor is laid in mosaic; the nave passages and floors of porches are tiled. The roof, which is of open timber construction, is panelled with pitch-pine. The chancel arch is supported on polished granite shafts with carved capitals and moulded bases. The edifice was erected by Mr. James M'Adorey, builder, Dundalk, from the designs and under the superintendence of Mr. George L. O'Connor, Dublin. The statues in the niches at each side of the altar were presented by Mrs. Aungier. The gates of the altar rails were supplied by Messrs. M'Gloughlin.

CHRIST CHURCH, NORTHAMPTON.—The erection of this church has just been completed. The main structure is of local stone from Lady Robinson's Kingsthorpe pits, but both east and west ends are temporarily built of brick. The floors under the seats are of wood blocks, and the passages are paved with quarries. The carving to the exterior and to fittings has been executed by Mr. S. L. Reynolds, Northampton. Mr. Robert Cosford, of Northampton, was the general contractor; the architect being Mr. M. H. Holding, also of Northampton. The artificial lighting is by electricity, the installation having been carried out by Mr. W. C. Mansell, of Northampton. The heating is by means of hot water. The seating at present is for about 600 people, but to complete the scheme the chancel, chancel aisle, vestries, western tower, and western porches have to be added. The amount of the contract was 5,800*l.*

WESLEYAN CHURCH, GATESHEAD.—On the 6th inst. the opening ceremony took place of the new Wesleyan Methodist church in Durham-road, Gateshead. The building is in the early Gothic style, and is surmounted by an octagon turret, about 90 ft. in height. The church is seated for 671. The architect for the work is Mr. W. Stanley Ellison, of Liverpool; and Mr. Alexander Pringle, Gateshead, is the contractor. The stone has been supplied from Mr. Pringle's quarry at Beacon Lough, near Wrekenton.

WESLEYAN SCHOOLS, KETTERING.—The foundation-stones of the new Wesleyan Methodist Sunday schools in Regent-street, Kettering, were formally laid on the 4th inst. The schools are being erected to plans prepared by Messrs. Gotch & Saunders, and the estimate for the building is 1,588*l.* 10*s.*, the contract having been secured by Messrs. E. & F. Henson, of Kettering.

BAPTIST SUNDAY SCHOOL, BROMLEY.—The foundation-stones of the new Sunday school, which is being erected on the land at the rear of the Bromley Baptist Church, were laid recently. The building is designed upon one floor only, and will have a main assembly-hall, 42 ft. 6 in. long and 34 ft. wide, with classrooms on all sides, being lighted from the clearstory rising above the flat roofs over the classrooms. The hall will have an average pitch of about 20 ft. On the east and west sides there will be small classrooms divided from one another by "Climax" folding partitions, which when required will be thrown back and increase the width of the hall to 50 ft. These rooms will be seven in number, each about 8 ft. square. On the northern side of the building a room has been provided for the secretary and librarian, a Bible classroom for seniors, the kitchen and the boys' lavatories. On the southern side is another seniors' classroom and the infants' classroom, also the lavatories for girls. The front elevation will be faced with red Kentish bricks, and all other elevations with picked stocks and red string courses. The stone dressings are to be of Bath stone from the Monks Park quarries. Welsh slates will be used in covering the main roof and lead on the flats. The whole of the joinery will be in pitch-pine. It is proposed to light the building with gas and warm it by a system of low-pressure heating. The building has been designed by Mr. Percy Coad, Bromley, and the builder is Mr. T. D. Graty, also of Bromley.

NEW COUNCIL SCHOOL, PRESTON.—The corner-stone of the Roebuck-street School, Preston, was laid a short time since. The site of the school is nearly an acre in extent, and the school, which is of the central hall type, will be erected according to the designs of Mr. H. Howarth, architect, of Morecambe, whose plans were selected in competition. In addition to the ordinary elementary curriculum, provision will be made for training the boys in manual work and imparting a knowledge of cookery to the girls. Though not included in the original scheme, sanction may be sought for an additional grant of 500*l.* for a laundry-room, and it is proposed to utilise the caretaker's house, which will stand in one part of the playground, for training in housewifery. The two central halls, each 1,060 sq. ft. in dimensions, not only act as lungs to the apartments adjoining, but may be used for marching and drill during wet days or on any occasion when it is desired to group the scholars. The school will be divided into two departments—the infants and the mixed. In the latter there will be six rooms, five of which will accommodate 60 children each and one 50. For infants there are four classrooms, one to hold nearly 60 and three to accommodate 54, thus giving a total accommodation of 570. The cookery-room will have an area of 752 sq. ft., the manual instruction room 700, and the two teachers' rooms each 128 sq. ft. The contract was let to Mr. T. Cottam, Preston, for 6,350*l.*

PUBLIC LIBRARIES IN ST. PANCRAS.—The Public Libraries Committee of St. Pancras Borough Council has provisionally arranged to purchase for 4,400*l.* a site of 3,834 sq. ft. in Mabledon-place for the purpose of erecting thereon the proposed second largest library in the borough. The principal façade of the new library is to be in a new road now being constructed by the Borough Council, situated between the Gray's Inn-road and the Tottenham Court-road districts. The Borough Engineer estimates that the cost of the Highgate district library will be 3,860*l.*

SCHOOL, BALSHAGRAY, GOVAN, GLASGOW.—Mr. James Caldwell, M.P., opened the Balshagray Public School on the 5th inst. The building consists of three stories, with a front to Dumbarton-road, and is built of Corncockle stone in the Roman classic style. There is accommodation for 1,415 scholars. In connexion with the school there is a swimming pond 75 ft. long by 30 ft.

broad, with dressing boxes and galleries on three sides. There is also a workshop for manual instruction, a cookery room, and the usual janitor's house. The buildings are from designs by Messrs. Bruce & Hay, architects, Glasgow, and the cost is estimated at 29,000*l.*

COUNCIL SCHOOLS, BIRMINGHAM.—The secondary and elementary schools erected by the Education Committee of the City Council in City-road, has just been opened. The area of the site, including playgrounds, etc., is 10,280 square yards and the length of the buildings is 450 ft. The schools are built of brindled Black Country bricks, with dressings of mottled Hollington stone. The roofs are of Hartshill tiles, and the construction throughout is fire-resisting. The architects are Messrs. Buckland & Farmer. A feature of the building is the tower, which serves the double purpose of ornament and ventilation. The secondary school affords accommodation for 600 pupils, 300 boys and the same number of girls. The main teaching rooms for their use are on the ground floor, and the special rooms, chemical laboratories, gymnasium, and art rooms are upstairs. Two central halls are provided, each 74 ft. long and 32 ft. wide, one for the boys and the other for the girls. In the sixteen classrooms provision is made for teaching the boys wood and metal work, and the girls cookery and laundry work; while the pupils of both sexes will be instructed in chemistry and physics, and they will be allowed the use of the gymnasium. In the basement dining-rooms have been fitted up for the convenience of the scholars. The elementary school is distinct from the secondary, although it is part of the main block. Accommodation is provided for 600 children—400 in the mixed rooms, and 200 infants. There are two halls, one for the mixed children and the other for the infants, each 48 ft. long by 25 ft. wide, and twelve classrooms have been arranged. The heating of the building is by means of low-pressure steam, and the ventilation is on the exhaust principle, the foul air being extracted by two rotary fans driven by electric motors. The chemical laboratory is ventilated in a similar manner, but on a separate system, and the inlets for fresh air are at the back of radiators. The total cost of the buildings, exclusive of the site, will be between 40,000*l.* and 45,000*l.*

POST OFFICE EXTENSIONS, CHELTENHAM.—The additions which have been made to the Cheltenham Post Office have now been completed. The new front has been executed in Bath and Portland stone, and is in harmony with the Grecian style of the rest of the building, with the difference that the details of the former are Doric and those of the latter Ionic. The public office now measures about 47 ft. by 27 ft., and has a counter 55 ft. in length. The remainder of the ground floor is taken up by the sorting office and the telegraph messengers' room. On the first floor of the front building are placed the Postmaster's and Chief Clerk's offices, and retiring-rooms for the postmen. The postmen's sorting office occupies the whole of the first floor of the back building. The telegraph and telephone rooms are on the second floor of the front building, the remainder being occupied as retiring-rooms for the male and female clerks. In the basement accommodation is provided for the telegraph linemen and postal and telegraph stores. Except in the Postmaster's and Chief Clerk's offices, which retain the fire-grate, the heating is by hot-water pipes. The general contractor was Mr. Coleborne, of Swindon. The work has been carried out from the designs of Mr. John Rutherford, Architect of the Board of Works.

HOTEL, TURNBERRY, N.B.—A new hotel has been erected at Turnberry by the Glasgow and South-Western Railway Company, in connexion with the new line of railway which runs the entire length of the seaboard from Ayr to Girvan, and which will be officially known as the Maidens and Dunure Railway. The hotel adjoins the railway, and is connected with Turnberry Station by a covered way which leads through a conservatory to the entrance lounge. The building has been designed in the Georgian period of architecture, and has a frontage of 300 ft. The external walls are rough cast, coloured a light cream; the woodwork of the windows, verandah cornices, etc., have been relieved with pure white, while the roof is of red tiles. Altogether there are one hundred visitors' bedrooms. The entire building is lit by electric power, produced by a suction gas plant with two 50 horse-power engines, and electric lifts communicate with the various floors. The building was designed by Mr. James Miller, Glasgow.

FREE LIBRARY, LITTLEHAMPTON.—The new Littlehampton Free Library has just been opened. The building is situated at the corner of Maltravers-road and Fitzalan-road, and has its main front facing south-east, with an entrance from each road leading up to a central porch, from which the chief public rooms are directly approached through an arched corridor. The building contains a lending library 30 ft. by 20 ft., reference library 17 ft. by 17 ft., a news and magazine-room 33 ft. by 17 ft., on the ground floor, where also are the librarian's private room and workroom, which are entered from the lending library. The back portion contain a boiler-house and usual offices, while over the librarian's room and the workroom are two store-rooms. The rooms on the ground floor are divided by means of glazed lead light screens and doors, and the main portions of the building are heated by low-pressure hot-water apparatus, and radiators. Gas lighting is employed, incandescent burners being used. Pitch-pine has been employed for the roof, which is boarded and covered with Staffordshire tiles, and the floor is composed of pitch-pine blocks. The building is designed in the Tudor style, plain red kiln Poling bricks being used, with stone bands, sills, mullions, lintels, etc. The plans for the work were prepared by Mr. H. Howard, the Surveyor.

THE PALACE, CLACTON.—This building, which has just been opened, occupies a site of four acres, and has cost about 40,000*l.* It is situated on the West Cliff, overlooking the sea. The architects were Messrs. Spencer & Tighe. The theatre, which is the main building, will seat 1,500 persons, and it contains a supper lounge and various alcoves. It is approached by an entrance-hall, which also gives access to a couple of terraces. In the grounds a bandstand is reared in a pool, and there are tea-houses in the Japanese, Indian, and Swiss styles. The structure is built entirely of steel and iron framing, and the whole of this work has been carried out by Messrs. D. Rowell & Co., of London, under the management of Mr. W. W. Pepper. The grounds have been laid out under the supervision of Mr. T. B. Harpham. The artistic continuation scenery is the work of Mr. R. Burriss, the electric contracts have been carried out by Messrs. Mayfield & Co., of London, and the superintendent-general has been Mr. Gatfield.

CLUB PREMISES, WHITSBURY, HANTS.—The foundation-stone of a new clubroom has just been laid at Whitsbury. The architect is Mr. Fred Bath, of Salisbury, the builders being Messrs. Frederick Merrick & Son, of Glastonbury, Somerset.

FACTORY, HULL.—New works are being erected by the National Radiator Company on the north of Springhead-road, Hull. The architect is Mr. H. Heathcote, of Messrs. Charles Heathcote & Sons, London; Messrs. Arnold & Sons, Doncaster, are the general contractors; Messrs. Dorman, Long, & Co., Middlesbrough, the contractors for the steel work; Messrs. Bell & Co., Liverpool, for the erection of the steel work, Messrs. Hewitt & Sons the zinc roof; Messrs. Henry Hope & Sons, Birmingham, the windows; and Mr. F. Abba is executing the plumbing work.

ISOLATION HOSPITAL, READING.—The opening of the new hospital for infectious diseases in Prospect Park, Reading, took place a short time ago. Mr. Charles Smith was the architect of the buildings. The general contractors were Messrs. Collier & Catley, and the engineering work has been carried out by Messrs. Barford & Perkins, of Peterborough. Mr. B. J. F. Webber acted as clerk of the works.

GENERAL POST OFFICE, EDINBURGH, EXTENSIONS.—A scheme of extension of the General Post Office, Edinburgh, is under consideration, and plans for the same, prepared by Mr. Oldrieve, of the Board of Works, have been sanctioned. Working drawings are now in course of preparation. The enlargement scheme is one of considerable magnitude, it being intended to build an extension eastward along the railway to Low Calton, and also to add an additional story to almost the whole of the present building. Nearly every department in the post office will have more accommodation assigned to it, and the administrative offices will be concentrated. It is also intended, for example, to bring into the enlarged building the engineering department and the office of the superintending engineer of the district, now outside the building. In preparing the elevations, the architect of the Board of Works has kept prominently in view the preservation of the *ensemble* of the group of buildings at the east end of Princes-street, as viewed from the south. To this end the sky-line of the post office block, after extension, as seen from the bridge, will be broken up by three steps, so to speak, leading from the lowest elevation on the east to the highest on the west, to meet the line of the North British Station Hotel. The wall top of the new buildings will be at the present level, and the "steps" will be to the west. Photographs have been taken of the corner, and it is believed that the additional story on the post office to the west, when treated in combination with the new building in the manner indicated, will restore the architectural scale of the neighbourhood, which was somewhat thrown out of joint by the height of the North British Hotel. The cost of the extension will be over 50,000*l.*—*Scotsman.*

LIBRARY, KING'S HEATH, BIRMINGHAM.—On the 11th inst. the Carnegie Free Library, which has been erected at King's Heath, close to the railway station, was opened. The building, which has cost upwards of 3,000*l.*, has been built to the design of Mr. A. G. Latham, of Birmingham. It has been carried out in the classic Renaissance style, and the whole of the front and a portion of the side facing the station have been carried out in white Hollington stone and the other frontages are of red brick with stone dressing. A bold entrance with vestibule, having wrought-iron gates, is provided facing the main road. From thence swing doors lead to the reading and news-room, and the lending and reference departments. The reading-room has a circular, panelled ceiling, and, in addition to accommodation at the tables for forty-two readers, there is a recess with wall slopes and independent newspaper stands of fumed and polished oak providing for about a score of newspapers. In the centre of the building is the lending department, in which shelves are provided for 11,000 volumes. The borrowers' space, which forms the corridor to the reference room, is 11 ft. wide, and is furnished with a polished oak counter for service of books, and there is a seat for the use of persons waiting. The reference room is at the rear of the building, as far removed as possible from the noise of traffic, and is provided with shelves for over 4,000 volumes.

PROPOSED NEW GUILD HALL, PERTH.—Plans have been prepared by Mr. A. Granger Heiton, architect, Perth, for a new guild hall, which it is proposed to erect in High-street, Perth. The building will be of the XVIIth century style. On the ground floor there are to be one large double shop and one single shop, the floors of which will be of wood blocks, while the ceiling will be of concrete fireproof. A low platform with panelled front is to be erected at the east end of the hall. If chairs are used accommodation will be provided for 100 persons, and twenty on the platform. Ventilation is provided by shafts led from the ceiling to the turret ventilator on the roof. A cloak-room, lavatory, and store are provided over the main staircase. The hall will cost about 2,250*l.*

Sanitary and Engineering News.

GLASGOW MAIN DRAINAGE SCHEME.—On the 4th inst. Lord Provost Bilsland cut the first sod of the works at Shieldhall which form the third and the final section of the main-drainage scheme of Glasgow, which was inaugurated fourteen years ago. The whole of the works for taking the drainage of the north side of the city out of the River Clyde are already in operation, and when the works at Sheildhall are completed the drainage of the south side of the city will also be kept out of the river. The third section includes the whole municipal area of Glasgow on the south bank of the river, the burghs of Rutherglen, Pollokshaws, and Govan, as well as various residential and rural districts in the counties of Lanark and Renfrew. The extent of this section is 14 square miles. The works for the disposal of the sewage of this area were originally intended to be situated on the river bank at Braehead, about one mile eastward from Renfrew. It having recently been found that this position would be disadvantageous to the Trustees of the Clyde Navigation, it has been arranged to place the works at Shieldhall on the ground recently occupied as the timber depôt. The daily volume of dry-weather sewage to be treated at Shieldhall will be 47,000,000 gallons, and the works have the advantage of river frontage, with every facility of water carriage for receiving and dispatching materials. Mr. A. B. M'Donald is the City Engineer.

WIGTON WATER SCHEME.—On the 7th inst. Mr. H. P. Boulnois, Local Government Board Inspector, held an inquiry at the Council Chambers, Wigton, into an application by the Wigton Urban District Council for sanction to borrow 2,000*l.* for works of water supply, viz., the laying of a cast-iron main in the parishes of Boltons and Westward. Mr. J. W. Crookes (clerk) and Mr. Joseph Graham Carlisle (the Council's Water Engineer), appeared in support of the application, and there was no opposition.

BIRMINGHAM SEWAGE FARM.—Mr. R. H. Bicknell, Local Government Board Inspector, held an inquiry at the Birmingham Council House on the 11th inst., respecting the application by the Tame and Rea Drainage Board for sanction to borrow 49,500*l.* for the purpose of constructing four additional bacteria beds at Minworth Greaves. Mr. J. D. Watson, the Engineer of the Board, pointed out that at the present time they were able to deal with about a quarter of the dry-weather flow by means of the beds already in existence. The new ones were to be constructed on the same principle, but the Board had gained knowledge from experience, which would lead to a lessening in the cost. The imperative necessity for more beds was shown by the fact that they were now dealing on the land with the sewage from 450 persons per acre, which was abnormally high, as it was held that anything above 100 or 150 per acre was excessive. Mr. Watson added that with the additions proposed they would be able to deal with about half of the dry-weather flow. The land would be used for dealing with the remaining part of the sewage on irrigation lines.

SEA DEFENCES, HORNSEA.—On the 6th inst. Mr. P. M. Crosthwaite, M.Inst.C.E., the Local Government Board Inspector, heard the application of the Urban Council, which has been made to the Local Government Board, for sanction to

borrow a sum of 12,500*l.* for works of sea defence, or, in other words, to repair the great damage done to the sea front by the recent spring tides, by the erection of a sea wall and groynes. Mr. W. T. Douglass, C.E., of London, the Council's Engineer, said his first report was in November, 1905, with a subsequent one in April of the present year, copies of which had been forwarded to the Local Government Board. The plans showed a sea wall from the north end of the Promenade-gardens to the New-road end with four groynes, but the Council had since decided to limit the length of the sea wall at the south end of the Gardens because of the expense attached. The plans presented embodied the scheme for which the loan was applied for, and included a sea wall with upper and lower decks and a groyne to the south, which was 745 ft. in length, with further ones of 550 ft., 430 ft., and 400 ft. respectively, making a total of 2,125 ft. The groynes were to be constructed 2 ft. 6 in. over the present beach line, and to have a crossing place provided for the Board of Trade rocket life-saving apparatus and the lifeboat. The scheme was estimated to cost 12,500*l.*

VENTILATION OF SEWERS.—Dr. Orme Dudfield, the Medical Officer of Health for Kensington, in his annual report, just issued, goes at considerable detail into the question of the ventilation of sewers, a subject which, he states, has engaged the attention of the local sanitary authority at intervals for thirty-five years to his knowledge. Summing up, Dr. Dudfield writes:—"Success has attended such efforts as the Kensington sanitary authority have made to cope with the nuisance from sewer emanations as by abolishing dead ends of sewers or by the ventilation of them; by the erection of pipe ventilators in substitution of offensive gratings at street level, and by the pan syphon trapping of offensive street gullies. Works of this sort carried out in the vicinity of Hurstway-street (in 1898) and in the Notting Dale 'special area'—which does not now possess a single entrapped gully or sewer grating at street level, sewer ventilation being effected by shafts—have proved effectual. I think it correct to say that wherever these means have been adopted, permanent good result, i.e., the prevention of nuisance, has been attained without detriment to the inhabitants of the locality. These means, applied with success locally, should be largely extended, and especially I would recommend an extension of the practice of abolishing dead ends of sewers (of which there are nearly 250 in the Royal Borough), or the effective ventilation of them when abolition would be either too costly or impracticable. This remedy, and a large increase in the number of pipe ventilators, so as to secure free circulation of air in the sewers, would, I believe, go a long way towards effecting the object in view, and thus put an end to the well-founded complaints which now recur during the hot weather every year, with painful regularity."

INTERCEPTING TRAPS.—The Works Committee of Hackney Borough Council reported on Monday having considered, in conjunction with the Public Health Committee, a letter from the London County Council with reference to a suggestion that by-law No. 5 of the series of by-laws (drainage etc.) made by the County Council under section 202 of the Metropolis Management Act, 1855, should be repealed. It had been resolved by the Joint Committee to inform the London County Council that while the Hackney local authority does not consider that the use of intercepting traps affords perfect protection, their use generally is desirable until the public sewers are efficiently ventilated.

WATERWORKS EXTENSION, LEYLAND.—At Leyland Public Hall, on the 1st inst., a Local Government Board inquiry was held by Mr. A. A. A. G. Malet, M.Inst.C.E., into the application of the Council to borrow 945*l.* for the purpose of water supply and 225*l.* for the construction of a bridge over Mill Brook at Slaters-lane, Leyland. Mr. Wrennall, who is the engineer of the scheme, explained the plans and details.

Foreign.

FRANCE.—The jury of architecture of the Ecole des Beaux-Arts appointed to judge the work of the First Class in Architecture, have awarded a Première Medaille to M. Levard, pupil of M. Pascal. The subject of the competition was "La Grande Salle d'une Bourse."——The Académie des Beaux-Arts has awarded to M. André Godard the prize founded by M. Deschaumes, the object of which is stated to be "pour encourager de jeunes architectes se distinguant par leur aptitude artistique et par leurs bons sentiments envers leur famille"; so that art and domestic affection are to be jointly encouraged. ——M. Rous has been appointed architect to the Administration of the Assistance Publique of Paris, in place of M. Lebrun, who has been superannuated.——The inauguration of the monument to Dumas *fils*, on the Place Malesherbes, took place on Tuesday. It is the work of M. Réné St. Marceaux, and consists of a marble statue of Dumas, represented seated, in an attitude of meditation, on a marble pedestal decorated with various female figures representing the principal heroines of his works, notably the "Dame aux Camelias."——The Mairie of Neuilly is to receive two large decorative pictures executed by M. Gervex and M. Poilpot. The picture by the first-named artist represents Louis XVI. and the celebrated agriculturist Parmentier on the plain of Sablonville; the subject of the other is the fête given by Murat in the Palais Borghese, at Neuilly, in honour of Napoléon and Josephine.——The official inauguration of the monument to Alfred de Musset, at Neuilly, is fixed for the 24th inst. The monument is the work of M. Granet, the sculptor.——The jury of the competition opened by the Conseil-Général of the Seine for the pictorial decoration of the Salle des Fêtes of the Mairie at Fresnes, has selected for execution the work of M. Enders, pupil of M. Cormon.——The municipality of Carcassonne have instituted a competition for a new asylum hospital "hôpital-hospice"). The jury have selected for execution the plans by M. Bertrand, of Paris, awarding a second premium to M. Vasson, of Carcassonne, and a third to M. Carlier, of Montpellier.——The jury in the competition opened by the municipality of Agen for the design for a municipal theatre, have awarded the first premium to M. Legendre, "architecte diplomé"; the second to M. Tronchet, of Paris, and the third to M. Bourgeois, of Poissy.——M. Tronchet has just carried out in the Bois de Boulogne, at the Pré Catelan, a large restaurant, accompanied by buildings in the style of the Norman farm buildings, and intended for use as stables and coach-houses.—The death is announced, at the age of eighty-two, of M. Pierre Joseph Dubel, architect "en retraité" to the Corporation of Paris, and a former pupil of Nicolle.

GERMANY.—The new bridge over the Elbe at Dresden is to be built from plans by Herr Wilhelm Kreis, and the work will be commenced this autumn.——The new town hall at Kiel is to be built under the direction of Professor Billing, at a cost of about 3,100,000 francs.

AUSTRIA.—It has been decided to adopt the designs presented by Professor Karl König for the new Industrial House to be erected in Vienna; Professor König will also superintend the carrying out of the building.——Herr Ludwig Tischler, architect, died at Vienna in his sixty-sixth year on May 25.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The District Surveyor's office for the Western Division of the City of London has been removed to 22, Bride-lane, Fleet-street.——After the 24th inst. the offices of the Quantity Surveyors' Association will be removed from 17, Bedford-row, to Caxton House, Westminster, S.W.——Messrs. Lanchester & Rickards, architects, have removed their offices from 1, Vernon-place to 47, Bedford-square, W.C.

PROPOSED COTTAGE BATHS, BIRMINGHAM.—The Baths and Parks Committee, in their report to the City Council, state that, acting on the authority of the Council, they have inspected various properties in the Floodgate-street area with the view of acquiring some old buildings which might be converted into cottage baths. The committee have come to the conclusion that the better course will be to secure a piece of land and erect a new building thereon. They now submit for consideration an offer by the Rev. W. H. Clariss, vicar of St. Gabriel's, Pickford-street, to lease for a term of 999 years, at a ground rent of 27*l.* 10s., or 6d. per yard, a piece of land 1,100 sq. yds. in area, having a frontage of 17 yds. to Bordesley-street. The committee submit a plan of the land, with sketch plans of the buildings proposed. The cost of the buildings, with all necessary fittings adapting them for use as cottage baths, including boundary wall, levelling and asphalting the site, is estimated at 2,000*l.*, which the committee propose to defray from revenue account. The proposed buildings will cover about 100 sq. yds., and the remainder of the area will be utilised as a playground for the district. The committee recommend that they be authorised to lease the land, and to proceed with the erection of the buildings.

HOUSING OF THE WORKING-CLASSES.—Before the House of Commons Select Committee on the Housing of the Working Classes, Sir J. Dickson Poynder presiding, Mr. Noel T. Kershaw, Assistant Secretary of the Local Government Board, attributed the reluctance of local authorities compulsorily to acquire land for the erection of workmen's cottages to the fact that it was generally found that such action resulted in a loss to the rates. The cost of a cottage was, as a rule, 200*l.*, and it was seldom possible to get a rent which would represent a fair return on the outlay. This consideration, and the knowledge that rates were rising, made the local authorities hesitate in embarking on an enterprise which was risky. Alderman Thompson, of Richmond, Surrey, Chairman of the National Housing Reform Council, said he had made a structural examination of nearly all the municipal workmen's dwellings in this country and on the Continent. He produced a return showing that of 578 cottages, the cost of building averaged from 40*l.* to 70*l.* a room, and charging 2s. 6d. per week—which was the rule—for each 100*l.* expended, the rents were greater than a workman could pay. Witness held the opinion emphatically that by standardising the parts of cottages the cost of production could be reduced to 30*l.*, and in rural districts, where labour was cheap, to a figure even considerably lower. Witness lamented the apathy which was displayed with regard to local government, except on the part of men who had a financial interest. These men should at least be kept off the building committees of local authorities. In one town the Chairman of the Building Committee was a builder, and it was, therefore, given to him to pass his own plans. When witness last inquired into the matter every builder on the council was on the Buildings Committee. That was in a town, and in a country place the difficulties would be greater.

THE DECAY OF GLASGOW MUNICIPAL BUILDINGS.—Mr. Alexander Muir, in a Report to the Glasgow Corporation Municipal Buildings Committee regarding the restoration of the masonry of the buildings, which his firm have been carrying out since 1901, says his opinion is that the treatment has been quite successful, and his confidence in the Szerelmey stone liquid as being the best-known stone-preserving preparation is as strong as it ever was. In a building so large as the municipal buildings it is almost too much to expect that every stone will yield perfectly to the treatment, and some stones in the cornice of John-street front seem to show decay since being treated. What the extent of this decay is it is difficult to say by examination from the street, as a considerable quantity of soot and dirt is lodging on this cornice, occasioned by the discharge of smoke from the stalk of the cold storage building in George-street, which was very often blown direct on to the John-street front. He cannot say whether the discharge from this stalk would have a bad effect on the stone forming the cornice; it certainly was not in its favour. John-street front was the first treated, and at the beginning of the work he had an idea that the cost of the work should be kept down as much as possible, consequently he did not cause some stones to be cut out and replaced by new ones, which he now realises has been a mistake. He thought at the time that re-hewing them and coating with the liquid would suffice. It was not long, however, until he realised that it was essential to cut out stones freely and replace with new ones, and since then he has had this done. Looking over the whole building, he sees nothing even to suggest that the treatment is likely to prove anything but a thorough success.

A NEW MODEL VILLAGE, NEAR BOURNVILLE.—It has been decided at the Cotteridge, King's Norton, to establish a Co-operative Tenants' Society, upon co-partnership principles, for the provision of artisans' dwellings on "model village lines." Mr. George Cadbury, the founder of Bournville, addressing the co-operative delegates, expressed his conviction that the physique of the nation could only be maintained by those who worked in factories during the day being able to get out to cottages with gardens in the evening. Municipalities had made a stupendous mistake in buying and pulling down slums, and he believed such cottages as he indicated could be provided if in future the municipalities confined themselves to buying up the land around our great towns and cities. If fifty years ago that had been done by Birmingham the city would to-day be surrounded by hundreds of Bournvilles instead of by suburbs miserable, dreary, and desolate. The Bournville Trust had offered to a local Co-operative Tenants' Society 20 acres of land on lease at a rent of between 5 per cent. and 6 per cent., which he thought a municipality would be perfectly justified in doing. The lease would, after the Scotch fashion, be renewable at the end of ninety-nine years at a valuation, so that the house-owner did not lose his house at the expiry of the lease. The 20 acres offered by the Bournville Trust has a frontage of 400 yards to Northfield-road and about 270 yds. to Woodlands Park-road, is in close proximity to King's Norton station, and within a quarter-hour's walk from the Pershore-road trams. The ground rent will be at the rate of 11*l.* 10s. per acre. The society, if formed, will have the option of taking up 5 acres only at a time, which will relieve them of a large amount of expenditure, which they would necessarily incur if the whole of the 20 acres were taken at one time. The number of houses must not exceed eleven per acre. The land will be let on a lease for ninety-nine years, at the end of which time the society would have the option of a further lease or leases at revised terms. For every 10 acres taken by the society, the Bournville Village Trust will grant 1 acre of the ten free of cost, so that for 20 acres leased, ground rent will have to be paid on only 18 acres, the remaining 2 acres to be used as permanent open spaces. Mr. George Cadbury has offered to erect an iron hall to be used for public purposes as soon as 100 houses are erected.

EDINBURGH OLD CITY WALL.—At a meeting of the Treasurer's Committee of the Edinburgh Town Council, held on the 7th inst., the question in dispute between the Town Council and the Governors of the Heriot's Hospital as to the ownership of the wall on the north side of the Hospital grounds was under consideration. A report on the question by the town clerk was before the Committee, in which it was shown that the wall in question was part of the old Flodden wall, and was the property of the Corporation. On the other hand, the Heriot Governors, who desire to use the wall as part of the foundation of their new building for the art department of the school, contended that it was at least a mutual wall, seeing that it was rebuilt in 1888 at the joint expense of the city and the Trust. After discussion, the Committee agreed to recommend to the Council that the wall in question belongs to the Corporation. Further, however, that the magistrates and Council should without giving any conveyance of the ground, or the wall, to the Heriot Governors, allow the Governors to build on the wall as desired; that no compensation or price should be asked, only that the Governors in all time coming should relieve the Corporation from the upkeep of the wall.

UCKFIELD NEW BUILDING BY-LAWS.—Mr. E. Walter (Vice-Chairman) presided at the meeting of Uckfield Rural District Council on the 11th inst. In connection with the carrying out of the Crowborough scheme, intimation was received from Messrs. John Taylor, Sons, and Santo Crimp, the Council's engineers, that they had arranged that Mr. Walter Clapham, A.M.Inst.C.E., should be their resident engineer on the works.—Major Thornton moved that the draft of the proposed new building by-laws, which had been before the Works Committee for a considerable time, should be submitted to the Local Government Board for their preliminary approval. The district, Major Thornton stated, had been split up into urban and rural areas for the purposes of applying the new by-laws, so that in future persons wishing to build in rural areas would not be tied and bound by the present most unsuitable by-laws, which would never have been passed but for the insistence of the Local Government Board, who thought they knew more about rural parishes than those who lived in them. Practically the only restrictions in future would be in regard to the sanitary arrangements. In the parts defined as urban, the by-laws would be to a certain extent more lenient than at present; where alterations were made they would be in favour of the owner.—The resolution was carried.

PROJECTING SHOP PROPERTIES.—At the St. Pancras Town Hall, on Monday evening, a meeting of property owners, convened by the local branch of the association for the amendment of the projecting shop clauses of the London Buildings Act, 1905, was held to protest against sects. 10 and 12 of the London Building Acts Amendment Act, 1905. Sir W. J. Collins, M.P., presided. Mr. H. D. Widdicombe explained the working of the clauses, which, he said, were calculated to inflict considerable hardship upon property owners and occupiers. Mr. T. B. Westacott proposed the following resolution:—"That this public meeting of owners and occupiers of projecting shop properties in the borough of St. Pancras, of which there are not less than 700, representing approximately some 1,400 owners and occupiers, views with alarm, and hereby records its emphatic protest against, sects. 10 and 12 of the London Building Acts Amendment Act, 1905, requiring the provision of concrete or other fire-resisting roofs to existing projecting shops and means of access to roofs. It also records its protest against sect. 10 as applied to lantern lights in existing projecting roofs, and appeals to the London County Council to take such immediate steps as may be necessary to repeal or amend the sections herein referred to, so far as they apply to existing buildings, having regard to their interference with the principle of security of contract and the arbitrary infliction of loss upon both owners and occupiers, not only by reason of the capital expenditure involved, but of the serious disturbance to peaceful possession and the infliction of damage upon all classes of trades carried on by the occupiers." Mr. Coleing seconded the resolution, which was supported by Mr. Balch. Sir W. J. Collins said the Act was framed with the intention of protecting life from fire, but the County Council had no desire to deal harshly, and he advised owners to take advantage of the exemption clause. Mr. H. C. Lea, M.P., said his sympathies were divided between the tenants and the owners, but he would follow the lead of the chairman. The resolution was carried, and a deputation appointed which the chairman said he would introduce to the County Council.

SOUTHWOLD HARBOUR.—Proposals are made to form a company for the enlargement and deepening, at an estimated outlay of 50,000*l*., of the harbour at the mouth of the River Blyth, Southwold, to render it available for the shipping employed in the local and Scottish fishing trade, and in the export trade to Germany and Russia.

PROPERTIES FOR SALE.—Lundy Island, in the mouth of the Bristol Channel, and distant about 14 miles north-west from Clovelly, is about 3 miles long by from one to half a mile broad, and is well-nigh inaccessible, except on the east side. There are ruins of an ancient chapel dedicated to St. Anne, and, near the south-eastern point, of the castle named after Morisco, the pirate, who there suffered death for conspiring against the life of King Henry III. Lord Saye and Sele held the castle for the King in the Civil War, and it was occupied for a while by a French force *temp.* William III.—Ware Priory, Hertfordshire, embodying some remains of the religious house founded *temp.* Henry III., by Margaret, Countess of Leicester, as a cell to Ebralf in Normandy, and bestowed by Henry V. upon the Carthusians at Sheen.—Hudson House, near Ware, wherein are portions of the palace built by Henry VIII., which Queen Elizabeth gave to her kinsman, Henry Cary, Lord Hunsdon, whose monument in St. John the Baptist Chapel, Westminster Abbey, was erected by his son, and is the loftiest in the Abbey.—The estates, in three portions, of Lady Meux, extending over an aggregate of 20,000 acres in and near Wootton Bassett, Marlborough, and Dauntsey, North Wiltshire. The Downs estate, being the second portion, includes the West Woods, 700 acres in extent, and adjoins Savernake; the first portion comprises nearly all the town of Wootton Bassett, and the manor house of Vastern, at one time a Benedictine priory, and, it is said, the home of Anne Boleyn. The total rent-roll is computed at 22,660*l*. per annum, and facilities will be given to subsisting tenants of the farms to purchase their holdings.—Stoke Park, Stoke Poges, with a deer park of 300 acres, which once appertained to Windsor Forest, of which the ownership passed from Lord Mollines, *temp.* Edward III., to the Lords Hungerford, and from them to the Earls of Huntingdon (Hastings) (whose badge may be seen in the church), Lord Chancellor Hatton, and Sir Edward Coke, was bought by William Penn, for whose descendant John Penn the house was re-built by James Wyatt, with colonnades after the Doric order on the north and south fronts; Repton laid out the park, with its ornamental waters. The old manor house is the scene of Gray's "Long Story," written when it belonged to Viscountess Cobham.—Milton Ernest Mall, near Oakley, Bedfordshire, having a frontage of 600 yards to the river Ouse; the house was built in 1858, after Butterfield's designs in the Gothic style.—High Walls, Gullane, co. Haddington, near the Muirfield golf-links, of which Mr. E. L. Lutyens was the architect.—The "Tower House," one of those built in Bedford Park, Chiswick, by Mr. R. Norman Shaw, R.A.; and Palace-court House, Palace-court, Bayswater, planned and designed by Mr. Leonard Stokes, with a façade of stone and red brick in the Flemish manner. Of the Willesden Paddocks, a freehold of 165 acres, at Dollis Hill, we may mention that they formed the last resting place for cattle when driven from the north to the market at West Smithfield; and of Ivy House, North End, Hampstead, that it was the home of Professor Cockerell, R.A., who modelled the frieze, in the library, from the reliefs, discovered in 1812, of the frieze of the Temple of Apollo.

GAS LIGHTING AT THE NEW VICTORIA STATION.—The new Victoria Station, when complete, will be lighted by nearly 400 lamps, varying from 175 to 1,000 candle-power, and giving a total light of about 140,000 candle-power. Gas is supplied at a pressure of 50 in. from two Sale-Onslow compressors, each capable of delivering 5,500 cubic feet per hour, driven by gas engines, the plant being duplicated throughout, and the shafting so arranged that either engine can drive either or both compressors, in order to guard against the possibility of break-down. Two smaller compressors that can be run from the same shafting have been fixed for use when only a small number of lights are in use. The compressors are supplied through two 500-light dry meters (George Glover), inter-connected and by-passed, which are fed by a 6 in. main. The platforms are lighted by Sugg's "Chertsey" pattern lamps of 350 candle-power, except in the case of those on either side of the carriage drive, which are lighted by lamps of 500 candle-power. The lamps are placed one between each pair of columns carrying the roof, so that there is no shadow. The platforms are divided into sections by the Eccleston and Elizabeth Bridges, under which they pass, back-lanterns being chiefly used for lighting the portions under the bridges. The lamps lighting each of the platform sections are controlled by two taps (especially devised for the purpose by the Gas Light and Coke Company) placed at the end of the section, one tap controlling Nos. 1, 3, 5, etc., lamps, and the other Nos. 2, 4, 6, etc.; so that every alternate lamp can be lighted or extinguished in series from the control point. To enable this to be done, dual services have been run, with a third independent setvice for the by-pass supply. A special cup-and-ball joint is used for connecting the down-rod of each lamp to one of the two main supplies and to the by-pass service, the one cup-and-ball serving for the two connexions. Each lamp is connected to the down-rod supplying it by a cup-and-ball, so that the effects of vibration on the mantles are reduced to a minimum. A special mercurial seal is fitted to each down-rod to prevent air getting into the pipes when the gas is shut off at the "distant-control" tap. The down-rod is also fitted with taps to enable any lamp to be removed without shutting off the supply to the platform generally. Each section of the by-pass services is fitted with a governor regulating the pressure to 2 in. The by-passes are completely extinguished by the action of lighting the lamps. The station yard beyond the platforms is lighted by four "Belgravia" lamps (each 1,000 candle-power) on weldless steel columns, two 25 ft. and two 30 ft. high, the lamps being worked by "distant control" taps, similar to those used on the platforms, placed at the base of the columns, to avoid the necessity of climbing the ladder to light or extinguish the lamps. The signals, both ground and post, are lighted by flat-flame gas burners, supplied from the high-pressure services through double-governors, to save the expense of running special low-pressure supplies. The services for the ground signals and the column lights in the yard have been laid in pitch in wood troughing. The scheme for the lighting of the station, as submitted to and approved by Mr. Charles L. Morgan, Engineer to the railway company, was prepared by the Gas Light and Coke Company; the work of installation was accordingly entrusted to them, and is being carried out by their contractors—Messrs. Sugg & Company—under the direction of the company's chief inspector, Mr. F. W. Goodenough.

THE TATE GALLERY.—Mr. D. S. M'Coll has been appointed Director of the Tate Gallery.

THE SLATE TRADE.—The mineral statistics for 1905 show a falling off in output of roofing slates of 32,000 tons from open quarries, and 18,000 tons from mines (or underground quarries), together 50,000 tons, about 10 per cent. of the total output. This, with the great falling off in the imports of foreign slates, is bringing down the quarry stocks rapidly.

Legal.

ACTION BY BUILDING OWNER AGAINST BURIAL BOARD.

THE case of Godden *v.* the Hythe Burial Board came before the Court of Appeal, consisting of Lords Justices Vaughan Williams, Romer, and Moulton, on the 12th inst., on the defendants' appeal from a decision of Mr. Justice Kekewich in the Chancery Division.

The short facts of the case were as follows:—The defendant Board in 1905 found it necessary to provide a new burial-ground, and, having chosen a site, called a Vestry Meeting in April of that year, when a resolution was passed authorising defendants to acquire the land in question, subject to their obtaining the consent of the adjoining owners, if necessary. At this time there was only one house within 100 yds. of the proposed site, and the owner and occupier of such house consented in writing to the use of the land as a burial-ground. The plaintiff owned 7¼ acres of land adjoining the proposed new burial-ground, which he meant to develop for building purposes, and in April, 1905, he commenced to build two dwelling-houses on his land, and when the defendants completed their purchase of the land the walls of the plaintiff's houses were some 5 ft. or 6 ft. in height. On April 27, 1905, defendants carried out a burial within 80 yds. of the site of the plaintiff's houses, and between April and August they caused three other burials to take place, but all of these were outside the 100 yds. limit. In October, 1905, the plaintiff commenced to build two more dwelling-houses, which had been completed. In March last the defendants caused another burial to take place, within about 80 yds. of the first two dwelling-houses erected by the plaintiff. Plaintiff then commenced proceedings to restrain defendants from using any part of their new burial-ground for any burial within a distance of 100 yds. from the plaintiff's houses, in alleged contravention of sect. 9 of the Burial Act, 1855, which provides that no ground not already used as or appropriated for a cemetery shall be used for burials within the distance of 100 yds. from any dwelling-house without the consent of the owner and occupier. The case put forward by the defendants was that, as the ground had been used by them before the erection of any dwelling-house by the plaintiff, the latter could not now complain. Mr. Justice Kekewich, however, held that the plaintiff was entitled to an interim injunction in the terms of the notice of motion, he seeing no reason why the plaintiff should not be protected because he had not a dwelling-house at the date of the acquisition of the cemetery. Hence the present appeal of the defendants.

At the conclusion of the arguments of counsel, their lordships dismissed the appeal with costs, holding that the construction put by Mr. Justice Kekewich on sect. 9 of the Act of 1855 was the correct one.

Mr. Cripps, K.C., Mr. P. O. Lawrence, K.C., and Mr. Gatey appeared for the appellants; and Mr. Levett, K.C., and Mr. P. Wheeler for the respondent.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xvi.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

Contracts.

BUILDING.

JUNE 16.—**Gulval.**—WORK AT SCHOOL.—Cornwall Education Committee invite tenders for work at Gulval, Trythall Council school, including the erection of lavatory, etc. Plans, etc., at the school, or at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth. Forms may be had from the architect, or at the school. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, signed, on or before June 16.

JUNE 16.—**Kehelland.**—SCHOOL-HOUSE.—The Cornwall Education Committee invite tenders for additions to master's house, Kehelland Council school. Plans, etc., may be seen at the school, or at the office of Mr. Sampson Hill, Architect to the Committee, Green-lane, Redruth. Forms may be had from the architect, or at the school. Sealed endorsed tenders to be sent to Mr. F. R. Pascoe, Secretary, Education Office, Truro, on or before June 16.

JUNE 16.—**Pannal.**—RESIDENCE.—The separate trades required for the erection of a villa residence at Pannal, for Mr. G. E. Dixon. Tenders to be lodged not later than noon, June 16. Mr. John E. Stocks, architect, Greek-street-chambers, Park-row, Leeds.

JUNE 16-26.—**Wakefield.**—ASYLUM BUILDINGS.—The Committee of the Storthes Hall Asylum invite tenders for the erection of the second portion of the main institution. Plans may be seen, and bills of quantities obtained, on application to the offices of the County Architect, Mr. J. Vickers-Edwards, County Hall, Wakefield, from June 12 to June 16. A deposit of 3*l.* 3s. is required. Cheques, etc., to be made payable to and forwarded to the West Riding Treasurer, County Hall, Wakefield. Sealed tenders, properly endorsed, to be delivered at the offices of the County Architect not later than 9 o'clock a.m. on June 26.

JUNE 18.—**Almondbury.**—HOUSES.—The erection of three dwelling-houses, at Dunkirk, Almondbury. Plans may be seen, and bills of quantities obtained, at offices of Mr. J. Berry, architect and surveyor, 3, Market-place, Huddersfield. Tenders, free of charge, to be forwarded to Mr. J. T. Prentis, Buxton-road, Huddersfield, not later than 3 p.m. on June 18.

JUNE 18.—**Alverstoke.**—SHED.—Alverstoke Guardians invite tenders for pulling down and rebuilding a small shed, etc., at the Workhouse, Park-road, Alverstoke. Plan and specification may be inspected, and further particulars obtained, at the office of Mr. H. A. F. Smith, architect, Star-chambers, Gosport. Sealed tenders, marked "Shed," to be sent to Mr. F. B. Bulmer, Clerk to the Guardians, Guardians' Offices, High-street, Gosport, by noon on June 18.

JUNE 18.—**Woodbridge.**—MASONIC HALL.—A Masonic hall, New-street, Woodbridge. Plans and specification at office of Mr. Henry J. Wright, architect and surveyor, 4, Museum-street, Ipswich, between the hours of 10 a.m. and 4 p.m., Saturday 10 to 1, when quantities can be obtained upon the deposit of a cheque for 2*l.* 2s. Tenders, sealed and endorsed, to be delivered to Mr. George Booth, jun., Church-street, Woodbridge, not later than 6 o'clock p.m. on June 18.

JUNE 19.—**Egg Buckland.**—CHAPEL.—Plymouth Corporation invite tenders for the erection and completion of a chapel at the New Cemetery, Egg Buckland, in accordance with the plans, drawings, and specifications, which can be seen, and forms of tender and bills of quantities obtained, on receipt of a deposit of 2*l.* in cash. Sealed tenders, accompanied by the fully priced out bills of quantities, are to be deposited at offices of Mr. James Paton, Borough Engineer and Surveyor, Municipal Offices, Plymouth, not later than 5 p.m. on June 19.

JUNE 19.—**Penyrheol.**—HOUSES.—Nineteen dwelling-houses at Penyrheol, for the trustees of the Penyrheol Building Club. Plans and specifications may be seen at the Bowls Inn, Penyrheol, near Caerphilly. Tenders to be sent to the Secretary, Mr. E. Brinson, auctioneer, 29, Cardiff-road, Caerphilly, on or before June 19. Mr. G. L. Watkins, architect, Rectory-road, Caerphilly.

JUNE 20.—**Abergavenny.**—ALTERATIONS TO SCHOOLS.—The Managers of the Abergavenny Group of Council schools invite tenders for additions and alterations to the Park-street and Victoria-street Council schools, Abergavenny. Plans and specifications may be inspected at the office of the architect, Mr. Alfred Swash, Midland Bank-chambers, Newport, from whom bills of quantities may be obtained. Plans and specifications may also be inspected at the office of Mr. F. Baker Gabb, Clerk to the Managers, to whom separate tenders are to be sent, endorsed, "Tender for Park-street Additions" and "Tender for Victoria-street Additions" respectively on or before June 20.

JUNE 20.—**Clontarf.**—CHURCH.—Rebuilding of the new Methodist church and schools, Clontarf, according to the drawings and specification prepared by Messrs. W. M. Mitchell & Sons, architects, 10, St. Stephen's-green, Dublin, N., where they can be seen. Bills of quantities can be obtained from the surveyors, Messrs. Mumby & O'Rourke, 15, College-green, on payment of a deposit of 2*l.* 2s. Tenders to be sent in to the architects on or before June 20.

JUNE 20.—**Dublin.**—COLLEGE BLOCK.—New centre block and other works in connexion with the Dominican College, Eccles-street. Bills of quantities may be obtained from Messrs. Mumby and O'Rourke, surveyors, 15, College-green, on lodgment of 2*l.* 2s. Tenders, marked "Dominican College," to be received at office of Mr. J. P. Wrenn, M.R.I.A.I., architect, 189, Great Brunswick-street, Dublin, not later than June 20.

JUNE 20.—**Lymm.**—ADDITIONS TO HOUSE.—The Lymm U.D.C. invite tenders for an additional building to the gas manager's house. Specification and plan may be seen by appointment on application to the Gas Manager, Mr. W. L. Donaldson, Gasworks, Lymm, from whom all particulars may be obtained. Sealed tenders to be delivered not later than June 20, addressed to Mr. W. Mullard, Clerk to the Council, Council Offices, Lymm, and endorsed "Tender for Building."

JUNE 20.—**New Fryston.**—SIGNAL CABIN.—The Directors of the North-Eastern Railway Company invite tenders for the erection of a signal cabin at Fryston South, situate near New Fryston village, midway between Castleford and Burton Salmon. Plans, specification, quantities, and indenture may be seen at the office of the Company's Engineer, Mr. W. J. Cudworth, at York, where detailed quantities and form of tender may be obtained on personal application. Sealed tenders, marked "Tender for Signal Cabin at Fryston South," to be sent to the Engineer, Mr. W. J. Cudworth, at York, not later than June 20.

JUNE 21.—**Ashburton.**—SCHOOL ALTERATIONS.—Devon County Education Authority (Education Committee) invite tenders for alterations and additions to the Ashburton Council school. Bills of quantities and forms of tender can be obtained in due course upon payment of 1*l.* 1s. Applications must be sent to the architect, 1, Richmond-road, Exeter, not later than June 21.

JUNE 21.—**Barry.**—CHURCH.—Building a new church at Barry for the Rev. H. H. Stewart. The plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., 21, Dumfries-place, Cardiff. A deposit of 2*l.* 2s. must be made. The tenders are to be sent to architect not later than June 21.

JUNE 21.—**Caerphilly.**—COTTAGES.—The erection of forty cottages at Caerphilly for the Castle Building Club. Plans and specification can be seen at offices of Messrs. A. O. Evans, Williams, & Evans, architects, Pontypridd. Sealed, endorsed tenders to reach architects on or before June 21.

JUNE 21.—**Carnarvon.**—SCHOOLROOM.—The erection of new schoolroom, etc., attached to Engedi C.M. Chapel, Carnarvon. Plans and specification to be seen at office of Mr. Rowland Lloyd Jones, architect, Carnarvon, and Pwllheli. Sealed tenders, endorsed "Tender for New Schoolroom," to be sent to Mr. J. T. Jones, Bro Dawel, Llanbeblig-road, Carnarvon, not later than 6 p.m., June 21.

JUNE 21.—**Darlington.**—SCHOOL.—Darlington Education Authority invite tenders for the erection of a manual instruction school at Corporation-road; also for large additions and alterations to the Gurney Pease schools, Albert Hill. Plans and specification may be seen, and bill of quantities and form of tender obtained, at the offices of Mr. George Winter, Borough Surveyor and Waterworks Engineer, Town Hall, on depositing a cheque for 2*l.* 2s. Tenders, endorsed "Schools," must be sent to Mr. Hy. G. Steavenson, Town Clerk, not later than noon on June 21.

JUNE 21.—**Port Tennant, Swansea.**—CHURCH.—Building a new church at Port Tennant, Swansea, for the Rev. W. Evans. Plans and specification can be seen, and quantities obtained, at office of Mr. E. M. Bruce Vaughan, F.R.I.B.A., 21, Dumfries-place, Cardiff. A deposit of 2*l.* 2s. must be made. The tenders are to be sent to architect not later than June 21.

JUNE 21.—**Shipley.**—VICARAGE HOUSE.—Various works required in the erection of a vicarage house for the parish of St. Paul, Shipley. Plans may be seen, and bills of quantities obtained, at offices of Messrs. T. H. & F. Healey, architects, 42, Tyrrel-street, Bradford, from June 14 to June 21, on which latter day tenders are to be delivered.

JUNE 21.—**Trealaw.**—SCHOOL WORKS.—Rhondda U.D.C. invite tenders for the alteration and conversion of the old Trealaw schools into a school for girls and infants. Plans and specification may be seen, and bills of quantities obtained, at the office of the Architect, Mr. Jacob Rees, Hillside Cottage, Pentre, on deposit of 2*l.* 2s. Tenders must be made out upon the form of the Council, a copy of which may be had from the architect. Sealed tenders, endorsed "Tender for Trealaw Schools," accompanied by the priced quantities, must reach Mr. T. W. Berry, Director of Education, Council Offices, Pentre, Rhondda, not later than June 21.

JUNE 22.—**Belfast.**—STABLE.—The Committee of Parkgate Presbyterian Church invite tenders for the erection of stable buildings. Plans and specifications can be seen at the Manse, Parkgate; and at office of Messrs. Young & Mackenzie, architects and civil engineers, Scottish Provident-buildings, Belfast. Sealed tenders, addressed to the Rev. W. J. M'Kinney, A.M., to be lodged with architects on or before June 22.

JUNE 22.—**Longwood.**—DWELLING-HOUSES.—Erection of four dwelling-houses, at Lowergate, Longwood. Plans may be seen, and quantities obtained, at offices of Messrs. Lunn & Kaye, architects and Surveyors, Milnsbridge and Huddersfield, from June 14 to June 22, on which latter date sealed and endorsed tenders must be delivered at Milnsbridge not later than 5.30 p.m., free of charge.

JUNE 22.—**Salisbury.**—OPERATION WARD.—Alterations to the operation ward of the infirmary, the plans and specifications of which can be seen at the offices of the architects, Messrs. John Harding & Son, 58, High-street, Salisbury. Tenders to be delivered to Mr. S. Buchanan Smith, Secretary, Crown-chambers, Salisbury, before 4 p.m. on June 22.

JUNE 22.—**Yelverton.**—CHAPEL.—New Bible Christian Chapel at Yelverton, Devon. Plans and specification may be seen with Mr. W. W. Hooper, Heatherleigh, Yelverton, and at the offices of the architect, Mr. W. Beddoe Rees, 3, Dumfries-place, Cardiff, from whom bills of quantities may be obtained. Tenders to be sent to Mr. Hooper on or before June 22.

JUNE 23.—**Birkenhead.**—POST-MORTEM ROOM.—The Corporation of Birkenhead invite tenders for the erection and completion of a post-mortem room, Livingstone-street. Plans, specification, and particulars can be seen, and bills of quantities and form of tender obtained, on application at the office of Mr. Charles Brownridge, M.Inst.C.E., Borough Engineer and Surveyor, upon a deposit of the sum of 1*l.* 1s. Tenders, upon the printed form supplied, sealed, and endorsed "Tender for Post-mortem Room," to be sent in to Mr. Alfred Gill, Town Clerk, Town Hall, Birkenhead, not later than 12 o'clock noon on June 23.

JUNE 23.—**Good Easter.**—COTTAGES.—A pair of labourers' cottages at Good Easter, Essex. Plans and specification can be seen at office of Mr. Frank Whitmore, architect and surveyor, 73, Duke-street, Chelmsford. Tenders to be delivered to architect not later than 10 a.m., June 23, endorsed "Tender for Cottages at Good Easter."

JUNE 25.—**Barnsley.**—SCHOOLS.—Barnsley Education Committee invite tenders in the whole or separate trades for the erection of three elementary schools, to accommodate 360, 300, and 360 scholars respectively, on a site in Racecommon-road, Barnsley. Applications, together with a deposit of 2*l.* 2s., to be made to architect, Mr. Ernest W. Dyson, 14, Market-hill, Barnsley, not later than Monday, June 25.

JUNE 25.—**Llanbradach.**—HOUSES.—Thirty-one houses at Llanbradach for the Llanbradach Building Club. Plans and specification can be seen at office of Mr. John H. Phillips, F.R.I.B.A., architect, Clive-chambers, Windsor-place, Cardiff, and sealed tenders are to be delivered on June 25.

JUNE 25.—**Redruth.**—HOSPITAL ADDITIONS.—The Committee of the West Cornwall Miners' and Women's Hospital invite tenders for the erection and completion of proposed building, comprising an operating theatre, with adjoining rooms and corridors, according to plans and specifications, which may be seen by appointment at the office of Mr. Sampson Hill, architect, Green-lane, Redruth. Sealed tenders, endorsed "Tender for Operating Theatre," to be sent to Mr. C. Tweedy, Hon. Secretary, Capital and Counties Bank, Redruth, not later than 10 o'clock on June 25.

JUNE 25.—**Tylorstown.**—CONVERTING PREMISES INTO SHOPS.—Extending and converting premises in Tylorstown into two shops for Mr. A. I. Loble, outfitter, East-road, Tylorstown. Plans and specification can be seen at offices of Messrs. A. O. Evans, Williams, & Evans, architects, Pontypridd. Sealed, endorsed tenders to be sent to Mr. Loble on or before June 25.

JUNE 25.—**Usworth.**—CHAPEL EXTENSION.—Extensions to High Usworth Wesleyan Chapel, and for decoration of the interior. Plans and specifications at the office of the architect, Mr. J. Walton Taylor, F.R.I.B.A., St. John-street, Newcastle. Sealed tenders, properly endorsed, are to be delivered to Rev. Theodore Bishop, 11, Regent-terrace, Gateshead, not later than 10 o'clock, June 25.

JUNE 26.—**Aber-Bargoed.**—HOUSES.—Erection of thirty houses at Aber-Bargoed for the Ty-Fry Building Club. Plans, specification, and form of contract can be seen and form of tender obtained at the office of Mr. D. J. Thomas, architect, High-street, Blackwood, Mon.; or at the Ivy Bush Hotel, Pengam, Mon. Sealed and endorsed tenders are to be addressed to the Chairman of the Club, Mr. T. B. Yendoll, and delivered at the Ivy Bush Hotel, Pengam, not later than 12 o'clock noon on June 26.

JUNE 26.—**Kelly Bray.**—SHOP AND HOUSE.—For the erection of a shop and dwelling-house at Kelly Bray, for Mrs. Wearing. Plans, specification, etc., may be seen at the office of Mr. Lawrence Scantlebury, architect and surveyor, Callington. Tenders to be delivered at the architect's office on or before June 26.

JUNE 26.—**Stanleytown.**—HOUSES.—For the erection of three houses and vestry at Stanleytown, Rhondda Valley, for the trustees of the Welsh Calvinistic Methodist Chapel, Pontygwaith. Plans and specification may be seen with Mr. William Williams, grocer, Cash Stores, Pontygwaith, to whom

sealed and endorsed tenders are to be delivered before 5 p.m. of June 26. Mr. W. D. Morgan, architect, Victoria-chambers, Pentre.

* JUNE 26.—**Wrexham.**—ENLARGEMENT OF POST OFFICE.—Tenders are invited for the enlargement of the head post office at Wrexham for the Commissioners of H.M. Works. Drawings, specification, copy of conditions, and form of contract, to be seen on application to the Postmaster, between 10 a.m. and 5 p.m. Bills of quantities and forms of tender can be obtained, on deposit of 1*l.* 1s., at the undermentioned address. Tenders, endorsed "Tenders for Enlargement of Head Post Office, Wrexham," to be delivered to the Secretary, H.M. Office of Works, Storey's-gate, S.W., before 12 noon, June 26.

JUNE 27.—**Port Talbot.**—HOUSES.—The Port Talbot Building Club invite tenders for the erection of thirty-five houses at Port Talbot. Plans and specifications may be seen at offices of Mr. R. O. Clarke, C.E., Station-street, Port Talbot. Sealed tenders are to be addressed to Chairman of the Club, Grand Hotel, Port Talbot, not later than June 27.

* JUNE 28.—**Cardiff.**—FOG SIGNAL HOUSE.—The Trinity House Corporation invite tenders for the erection of a fog signal house, dwelling, etc., on Flatholm Island. The plans may be inspected, and forms of tenders obtained, either at Trinity House, E.C., or on application to the Officer-in-Charge, Trinity Store, Cardiff. Applicants, when receiving a form of tender and specification, must deposit 1*l.*, on producing receipt for which at the offices of Messrs. Corderoy, Selby, & Corderoy, 21, Queen Anne's-gate, S.W., they may obtain the surveyor's quantities. Tenders, endorsed "Tender for New Fog Signal House, etc., Flatholm," to Mr. A. Owen, Secretary, Trinity House, E.C., on or before June 28.

* JUNE 28 ——— REGISTRY FOR SHIPPING AND SEAMEN.—Tenders are invited for the registry of shipping and seamen—adaptation for the Commissioners H.M. Office of Works. Drawings, specifications, copy of conditions, and form of contract, may be seen on aplication to Mr. J. B. Westcott, M.V.O., at the Office of Works. Bills of quantities and forms of tender may be obtained at undermentioned address on deposit of 1*l.* 1s. Tenders, endorsed "Tenders for Registry of Shipping and Seamen—Adaptation," to be delivered, addressed to the Secretary, at H.M. Office of Works, Storey's-gate, S.W., before 12 o'clock noon, June 28.

JUNE 29.—**Highley.**—SCHOOL ADDITIONS.—Salop C.C. Elementary Education Department invite tenders for the erection of certain additions at Highley Council school. Plans and specifications may be seen, and bills of quantities and forms of tender obtained, at the offices of Messrs. Gething & Son, architects, Oxford-chambers, Kidderminster, on payment of 1*l.* 1s. Tenders, sealed and endorsed, "Highley Council School," should be delivered to Mr. H. E. Wale, Secretary, 11, College-hill, Shrewsbury, not later than 12 o'clock noon on June 29.

JUNE 30.—**Barmouth.**—POLICE STATION.—Merioneth Standing Joint Police Committee invite tenders for the erection of a new police station at Barmouth. Plans and specifications and further particulars to be obtained from Mr. E. Vaughton, C.E., County Surveyor, Arthog, Dolgelley. Tenders, sealed and endorsed, to be sent to the Chief Constable's Office, Dolgelley, on or before June 30.

JUNE 30.—**Cooksbridge.**—SCHOOL.—East Sussex Local Education Authority invite tenders for the erection of a new public elementary school at Cooksbridge, Hamsey. Plans, specifications, and conditions of contract may be seen, and bills of quantities obtained, on application to Mr. Edwin Young, Secretary to the East Sussex Education Committee, County Hall, Lewes, between the hours of 10 a.m. and 4 p.m., Saturdays 10 a.m. and 1 p.m., and payment of a deposit of 2*l.* 2s. Tenders, endorsed "Tender for New School, Hamsey," to be addressed and delivered to the Secretary, at the County Hall, Lewes, not later than 10 a.m. on June 30.

JUNE 30.—**Preston.**—SCHOOL.—Preston Corporation invite tenders for the erection of a secondary school for girls, in Moor Park-avenue, Preston. Plans and specifications may be seen, and blank bills of quantities and form of tender obtained, at the Education Offices, Lancaster-road, Preston, on payment of 2*l.* 2s. Sealed tenders, endorsed "Tender for Secondary School," must be delivered, not later than 12 o'clock noon on June 30, to Mr. Henry Hamer, Town Clerk, Town Hall, Preston.

* JULY 2.—**Luton.**—SCHOOL.—Tenders are invited for the erection of new secondary school at Luton for the Bedfordshire C.C. Drawings, specifications, and form of contract may be inspected at Messrs. Spalding and Spalding, architects, 15, Queen-street, Cheapside, E.C., between 11 a.m. and 4 p.m., except Saturday and Sunday. Names and addresses to be sent to the architects, as above, on or before June 19, with a deposit of 1*l.* 1s. Tenders, addressed to Mr. W. W. Marks, Shire Hall, Bedford, and endorsed "Tender for Luton Secondary School," to be delivered before 5 o'clock on July 2.

* JULY 3.—**Cardiff.**—OFFICES, ETC.—Tenders are invited for the erection of new offices, stores, stables, etc., at Newtown Goods-yard, Cardiff, for the Great Western Railway. Plans and specifications may be seen, and forms of tender and bills of quantities obtained, of the engineer, Newport Station, between 10 a.m. and 4 p.m. Tenders, endorsed "Tenders for Works at Cardiff," to be delivered to Mr. G. K. Mills, Paddington Station, on or before July 3.

* JULY 4.—**Paddington.**—RECEIVING WARDS, ETC.—The Guardians of the Parish of Paddington invite tenders for receiving wards and porter's lodge at their workhouse in the Woodfield-road, W., pursuant to plans and specification to be seen at the offices of the Architect, Mr. F. J. Smith, Parliament-mansions, Victoria-street, S.W., between 10 a.m. and 5 p.m., where all necessary information can be obtained, as also form of tender. Bills of quantities can be also obtained on payment of 5*l.* 5s. Sealed tenders to be delivered at the offices of the Guardians, 313-319, Harrow-road, W., before 10 a.m., July 4.

* JULY 10.—**Croydon.**—SCHOOL.—The County Borough of Croydon Education Committee invite tenders for the erection of a school for 1,200 children in Davidson-road, Croydon, in accordance with drawings prepared by Mr. H. Carter Pegg, Architect, Thornton Heath. Bills of quantities and forms of tender can be obtained at the Education Office, Katharine-street, Croydon, on payment of 1*l.* 1s. Applications should reach the Clerk to the Committee not later than June 20, and tenders must be delivered before noon, July 10.

NO DATE.—**Cardiff.**—PUBLIC-HOUSE BUILDING.—For the following works for Messrs. Wm. Hancock & Co., Ltd., brewers and wine merchants, Newport and Cardiff:—(1) Pulling down and rebuilding the Foresters' Arms, at Risca; (2) pulling down and rebuilding the Rifleman's Arms, at Risca; (3) alterations and repairs to the Prince of Wales Inn, at Pontypool; (4) alterations and repairs to the Three Salmons Inn, at Pontypool; (5) repairs to Green Dragon Hotel, at Chepstow. Plans and specifications may be seen, and bills of quantities obtained, at the offices of Messrs. Swalwell & Havard, architects and surveyors, Steam Packet-chambers, Dock-street, Newport, Mon., on or after June 18.

NO DATE.—**Chard.**—KITCHEN, ETC.—Sundry works, including new drainage scheme and rebuilding of kitchen, offices, etc., at Mr. Tutcher's, Holyrood-street, Chard. For particulars apply to Messrs. Symes & Madge, architects and surveyors, Somerset House, Chard.

NO DATE.—**Horbury.**—HOUSES.—Erection of thirty-eight houses and shop at Horbury Junction, near Wakefield. Messrs. Garside & Pennington, architects and surveyors, Pontefract and Castleford.

NO DATE.—**Leeds.**—ALTERATIONS TO PREMISES.—The separate trades in connexion with the alteration of existing premises into houses and shops, and the erection of three new houses and shops, and three lock-up shops at Beeston-road, Leeds. Names to Messrs. Mosleys, rent collectors, 6, Wormald-row, Leeds, and a copy of quantities will be forwarded.

NO DATE.—**Newcastle-on-Tyne.**—WAREHOUSE.—For the erection of warehouse in High Friar-street for Messrs. W. D. Mark & Sons. Names to Mr. John W. Dyson, architect, 67, Grey-street.

NO DATE.—**Paignton.**—HOUSE.—Erection of a house at Paignton. Send names to Mr. J. Archibald Lucas, A.R.I.B.A., architect, Exeter. Quantities will be supplied.

NO DATE.—**South Ketton.**—FLATS.—Two flats. Plans and specifications may be seen at Screenman's Arms, South Hetton.

* NO DATE.—**York.**—NEW FACTORY.—Tenders are invited for the erection of a new factory about 250 ft. by 90 ft. by 60 ft., together with corridor and bridge. floors, foundations, stanchions, and staircase, to be reinforced concrete, for Messrs. Rowntree & Co. Plans can be seen, specification, quantities, and form of tender obtained, at the architect's office, The Cocoa Works, York, on deposit of 5*l.* 5s.

ENGINEERING, IRON, AND STEEL.

JUNE 18.—**Belfast.**—PORTABLE RAILWAY.—Belfast Holywood, and Castlereagh Joint Board invite tenders for the supply and delivery of about 2,500 lin. yds. of new or secondhand portable railway, with sidings, turnouts, and six tip waggons. Form of tender and schedule can be obtained on application to the City Sorveyor, Town Hall, Belfast. Tenders, endorsed "Portable Railway," to be lodged with Mr. R. Meyer, Clerk to the Board, Town Hall, Belfast, not later than 12 noon on June 18.

JUNE 18.—**Chorley.**—CLINKER ELEVATOR.—Chorley Corporation invite tenders for supply of a clinker elevator and revo'ving screen at their refuse destructor works, according to plan and specification, which may be seen, and any further information obtained, on application to Mr. Wm. Cunliffe, Nuisance Inspector, Back-street, Chorley. Tenders, endorsed "Elevator," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, before noon on June 18.

JUNE 18.—**Glasgow.**—RENEWAL OF UNDERBRIDGES.—The Directors of the Caledonian Railway Company invite tenders for the works to be executed in the construction of the steel work required in the renewal of the superstructures of the underbridges at 19 miles 34 chains, 34 miles 45 chains, 38 miles 30 chains, 48 miles 50 chains, 50 miles 7 chains, and Cogri Viaduct at 35 miles 68 chains north of Carlisle on main line. Drawings may be seen at the office of the Company's District Engineer, Princes-street Station, Edinburgh, where copies of the specification and schedule may be obtained on payment of 2*l.* 2s. Sealed tenders, endorsed "Tender for Steel Work Required in the Renewal of Underbridges, etc., on the Southern and Eastern District," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan-street, Glasgow, on or before June 18.

JUNE 18.—**Salterhebble.**—CONCRETE AND STEEL COVERING.—Halifax Improvement Committee invite tenders for the construction of a concrete and steel covering to a conduit at Salterhebble. Plans and specifications may be seen, and forms of tender obtained, on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax, upon payment of the sum of 1*l.* Tenders, endorsed "Covering Conduit," must be sent to Mr. Keighley Walton, Town Clerk, on or before June 18.

JUNE 18.—**Stoke-upon-Trent.**—PIPING.—The Electricity Committee invite tenders for the supply and delivery of various piping. Specification, and form of tender, may be obtained from the Electricity Works, Stoke-upon-Trent, on payment of a deposit of 2*l.* 2s. Tenders to be sent in, addressed "The Electricity Committee, Stoke-upon-Trent," not later than June 18, endorsed "Tender for Piping."

JUNE 18.—**Warrington.**—CAST-IRON TANK.—Warrington Sanitary Works Committee invite tenders for the supply of a circular cast-iron tank, 7 ft. diameter by 8 ft. deep, for Longford Depôt. Tenders, in securely-fastened envelopes, endorsed "Tender for Cast-iron Tank," and addressed "The Chairman, Sanitary Works Committee, Town Hall, Warrington," to be delivered not later than June 18. Richard Wilson, Manager, Longford Depôt, Warrington.

JUNE 19.—**Dublin.**—TIDAL FLAP VALVES.—Dublin Improvements Committee invite tenders for the supply, delivery, and erection of tidal flap valves, in the City of Dublin. The drawings, specification, and form of tender may be inspected at the office of the City Engineer, City Hall, Dublin; and at the office of the Consulting Engineer, Mr. George Chatterton, M.Inst.C.E., 6, The Sanctuary, Westminster, between the hours of 10 a.m. and 5 p.m. daily, Saturdays excepted, on payment of a sum of 3*l.* 3s. (crossed cheques only will be received in payment). Tenders, sealed, and endorsed on the envelope "Tender for Tidal Flap Valves, Contract No. 11.," must be addressed to the Chairman of the Improvements Committee, City Hall, Dublin, and delivered in this office before 12 o'clock noon on June 19. With each tender must be submitted the names of two sureties who will be prepared to execute a joint and several bond for the due performance of the contract, in a sum of one-fifth of the contract price.

JUNE 19.—**London.**—DECK SPANS, ETC.—The Secretary of State for India in Council is prepared to receive tenders from such persons as may be willing to supply (1) 150 ft. deck spans, (2) bearing plates, (3) spikes. The conditions of contract may be obtained on application to the Director-General of Stores, India Office, Whitehall, S.W., and tenders are to be delivered at that office by 2 o'clock p.m. on June 19.

JUNE 19.—**Manchester.**—TROLLEY WIRE.—Manchester Tramways Committee invite tenders for the supply of hard-drawn copper trolley wire. Specifications and forms of tender may be obtained on application to Mr. J. M. M'Elroy, General Manager, Tramways Department, 55, Piccadilly, Manchester. Tenders are to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester, endorsed "Tender for Trolley Wire," and must be received not later than 10 a.m. on June 19.

JUNE 19.—**Ripon.**—GAS HOLDER.—Ripon Gas Committee invite tenders for the reconstruction of a telescopic gas holder. Drawings and specifications and all particulars can be obtained on application to the Engineer and Manager, at his offices, Gas-works, Ripon. Tenders to be sent to Mr. M. Kirkley, Town Clerk, Town Hall, Ripon, on or before June 19.

JUNE 19.—**Wellingborough.**—GAS ENGINE.—Wellingborough U.D.C. invite tenders for the provision, delivery, and installation at their water-pumping station at Hardwick, near Wellingborough, of a gas engine and suction gas plant for driving two existing vertical treble-ram pumps capable of delivering 10,000 gallons per hour against 140 head. Particulars and plans can be obtained, and specifications seen, on application to the Council's Surveyor and Water Engineer, Mr. E. Y. Harrison, A.M.Inst.C.E., at his office in Park-road, Wellingborough, on payment of 2*l.* 2s. Tenders, sealed, and marked outside "Tender for Machinery," must be delivered at office of Mr. J. T. Parker, Clerk to the Council, 29, Church-street, Wellingborough, by 12 o'clock noon on June 19.

JUNE 19.—**Willesborough.**—BRIDGE.—Kent C.C. invite tenders for reconstruction of Willesborough Bridge, near Ashford. Plan and specification can be seen, and bills of quantities and tender forms obtained, between the hours of 10 a.m. and 5 p.m., on deposit of 2*l.* Sealed tenders, endorsed "Willesborough Bridge," are to be delivered to Mr. Frederick W. Ruck, County Architect, Maidstone, not later than 5 p.m. on June 19.

JUNE 20.—**Brynamman.**—ELECTRIC STREET LIGHTING.—Brynamman and District Electric Supply Company, Ltd., invite tenders for electric street lighting extensions, etc., from Brynamman to Gwaun-cae-Gurwen and Cwmgorse. Plans may be seen at the office of the Chairman, Mr. W. J. Williams, Ammanfryn House, Brynamman. Specifications and forms of tender may be had from the Secretary, Mr. Evan W. Evans, Cwmgarw-road, Brynamman; or from the Chairman, as above, on payment of a deposit of 1*l.* 1s. Sealed tenders, endorsed "Street Lighting Extension," to be in the hands of Mr. Evan W. Evans, Secretary, Cwmgarw-road, Upper Brynamman, R.S.O., on or before June 20.

JUNE 20.—**Chorley.**—PIPES.—Chorley Corporation invite tenders for the supply and delivery, at the Chorley Railway Station, of 1,500 yds. of 4-in. diameter, and 350 yds. of 6-in. diameter cast-iron main pipes. Specification and form of tender can be obtained from Mr. J. W. Allin, Gas Engineer, Chorley. Tenders, endorsed "Cast-iron Pipes," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, not later than noon on June 20.

JUNE 21.—**Llwynypia.**—BRIDGE.—Rhondda U.D.C. invite tenders for the construction of a bridge to carry a proposed new road over the Rhondda Fawr River at Llwynypia. The clear span of the bridge will be 52 ft., width of roadway 40 ft., heighth above water level 37 ft. The work will be let on two separate contracts. Contract for excavation, concrete, and masonry. Plans may be inspected on application at offices of Mr. W. J. Jones, Engineer and Surveyor, Public Offices, Pentre, Rhondda, and quantities and form of tender obtained on payment of a deposit of 1*l.* 1s. Tenders, endorsed "Llwynypia Bridge, Contract for Masonry, etc.," and addressed to the Chairman of the Council, must be delivered on or before June 21.

JUNE 23.—**Chesham.**—STANDPIPE.—Chesham U.D.C. invite tenders for the erection of a 6-in. cast-iron standpipe complete, with foundations, valves, and fittings, adjoining their high-level reservoir at Hivings Hill, within the Urban District of Chesham. Plans, sections, and specification may be seen upon application to Mr. Percy C. Dormer, Waterworks Engineer and Surveyor, Council Offices, Chesham. Tenders, endorsed "Stand Pipe," to be delivered to Mr. Dormer on or before June 23 at 10 a.m.

JUNE 25.—**Ossett.**—STANDPIPE.—Ossett Water Committee invite tenders for erection of standpipe, 30 ft. high, 6-in. pipes, and meter, at their Service Reservoir, Chidswell-lane, Ossett. Tenders, marked "Standpipe," to be sent to the Town Clerk's office, 1, New-street, Ossett, on or before June 25. For particulars apply to Mr. E. Illingworth, Water Inspector, Ossett.

June 26.—**London.**—CHAINS, SPRINGS, ETC.—The Southern Mahratta Railway Company, Ltd., are prepared to receive tenders for:—(1) 8,800 safety chains; (2) 9,736 spiral and volute springs; (3) 20 tons copper ingots, as per specifications and drawings, which may be seen at the offices of the Company. The charge for each specification is 1*l.* 1s., which will not be returned. Tenders must be sent

in addressed to the Secretary, marked "Tender for Safety Chains," or, as the case may be, not later than June 26. Mr. Edw. Z. Thornton, Secretary, 46, Queen Anne's-gate, S.W.

JUNE 26.—**London.**—PIPES.—The Metropolitan Water Board invite tenders for the supply and delivery of about 950 tons of 42-in. and other cast-iron pipes and castings. Forms of tender and contract, with specification, may be obtained, and the drawings inspected, upon application to the engineer, at The Firs, Southern-road, Fortis Green, East Finchley, N., between the hours of 10 and 4 (except on Saturdays). Tenders, enclosed in sealed envelopes, addressed to "The Clerk of the Board, Metropolitan Water Board, Savoy-court, Strand, W.C., and endorsed "Tender for Pipes and Castings—Staines Reservoirs Communication Works, Contract No. 25," must be delivered at the Offices of the Board not later than 10 a.m. on June 26.

JUNE 27.—**Erdington.**—OVERHEAD ELECTRICAL EQUIPMENT.—Erdington U.D.C. Tramways Committee invite tenders for the electrical equipment, on the overhead trolley system, of tramway No. 1 in their district (2 miles 2 furlongs 9·30 chains route length), including poles and overhead line equipment. Contractors desiring to submit tenders for the work should forward their names and addresses to one or other of the joint engineers, Mr. Robert Green, of 37, Waterloo-street, Birmingham; and Mr. H. H. Humphries, Engineer to the Council, Council House, The Park, Erdington, together with a deposit of 5l. 5s. Sealed tenders, endorsed "Tramways Equipment," to be delivered to Mr. Herbert H. Humphries, Engineer to the Council, Council House, Erdington, Birmingham, before noon on June 27.

JULY 2.—**Aylesbury.**—BRIDGES.—Aylesbury U.D.C. invite tenders for pulling down the existing two old brick bridges and the construction of two new steel girder bridges (over the Grand Junction Canal and Mill Stream), retaining walls, and the kerbing, channelling, metalling, etc., of the roadway between the two bridges. The drawings may be seen, and copies of the bill of quantities, specification, and form of tender obtained, on application to Mr. W. H. Taylor, Engineer and Surveyor to the Council, Town Hall, Aylesbury, on payment of 3l. 3s. Sealed tenders, which must be on the form supplied, and should be endorsed "Park-street Bridges," and addressed to Mr. Percy A. Wright, Clerk to the Council, Town Hall, Aylesbury, to be sent in not later than 4 p.m. on July 2.

JULY 2.—**Belfast.**—MOTOR-CAR SHED.—Great Northern Railway Company (Ireland) Directors invite tenders for an extension of the motor-car shed at their Belfast terminus. Parties wishing to tender may see the drawing and specification at the office of Mr. W. H. Mills, Engineer-in-Chief, Amiens-street, Dublin, or copies of them at the office of the District Engineer, Belfast, and can obtain at the said offices lithographed copies of the drawing, specification, and form of tender on payment of 10s. (not returnable) per set. Tenders, made out on the forms supplied by the Company, and endorsed "Tender for Motor-car Shed," should be delivered to Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, not later than 10 a.m. on July 2.

JULY 2.—**Epsom.**—CHESSINGTON WATER SUPPLY.—Epsom R.D.C. invite tenders for supplying about 814 yds. of 3 in. cast-iron water-pipes and the excavation of trenches, the carting and laying of the pipes, and the fixing of hydrants, etc. Specification of the works can be seen by appointment at the office of Mr. F. A. Pratley, the Surveyor to the Council, Waterloo-road, Epsom. Tenders, upon prescribed forms (to be obtained on application), must be delivered at office of Mr. W. O. Reader, Clerk to the Council, "Lonsdale," Epsom, not later than 6 o'clock p.m. of July 2, addressed "To the Chairman of the Epsom R.D.C., Lonsdale, Epsom."

JULY 2.—**Stirling.**—BRIDGE.—The Directors of the Caledonian Railway Company invite tenders for the works to be executed in removal of the existing bridge carrying the Company's main lines over the River Forth at Stirling, and in construction of a new bridge on the site thereof. The works comprise the construction of foundations, partly under water and of masonry, and the supply, delivery, and erection of about 500 tons of wrought steel-work. Drawings may be seen at the office of the Company's Engineer, Buchanan-street Station, Glasgow, where copies of the specification and schedule may be obtained on payment of 2l. 2s. An assistant engineer will attend at Stirling Station on June 18, at 10.45 a.m., to accompany contractors over and point out the site of the works. Sealed tenders, endorsed "Tender for Reconstruction of Bridge over River Forth at Stirling," to be lodged with Mr. J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan-street, Glasgow, on or before July 2.

JULY 2.—**Yiewsley.**—BRIDGES.—The County Highways Committee of C.C. of Middlesex invite tenders for demolishing the old bridge (to foundation level) crossing the Grand Junction Canal at Yiewsley, West Drayton, Middlesex, and for erecting a new structure of 40 ft. span in brick, stone, and steel in its place, in accordance with plans and specification, which may be seen at office of Mr. H. T. Wakelam, County Engineer, Middlesex Guildhall, Westminster, during office hours. Bills of quantities, with forms of tender, may also be obtained on payment of 5l. Tenders, endorsed "Colham Bridge, Yiewsley," must be delivered in sealed envelopes to Sir Richard Nicholson, Middlesex Guildhall, Westminster, S.W., on or before July 2.

JULY 4.—**Buntingford.**—WATERWORKS.—Buntingford R.D.C. invite tenders for the construction of new waterworks, including the providing and laying of cast-iron pipes, construction of reservoir and engine-house, and the provision of pumping machinery, at Buntingford. Drawings may be seen, and copies of the specification, bill of quantities, and form of tender obtained, at the office of the engineer, Mr. John Chadwick, F.G.S., Bletchley, Bucks, upon payment of a deposit of 3l. 3s. Sealed tenders, on the prescribed forms, endorsed "Tender for Waterworks," must be received at office of Mr. J. Chalmers-Hunt, Clerk to the Council, the Board Room, Union Workhouse, not later than 12 o'clock noon on July 4.

JULY 6.—**Wallasey.**—REFUSE DESTRUCTOR.—The Wallasey U.D.C. invite tenders for an extension of refuse destructor (not buildings), the specification of which, and further particulars, may be obtained on application to Mr. W. H. Travers, Engineer and Surveyor, Public Offices, Egremont, Cheshire. A charge of 3l. will be made. Tenders, enclosed in sealed envelopes, endorsed "Tender—Refuse Destructor," and addressed to Mr. H. W. Cook, Clerk and Solicitor, Public Offices, Egremont, Cheshire, to be forwarded per post not later than July 6.

JULY 7.—**Teignmouth.**—TEIGNMOUTH-PAIGNTON WATER SCHEME.—Teignmouth U.D.C. invite tenders for the laying and jointing of about 17,110 lin. yds. of 9-in., about 1,120 lin. yds. of 6-in., and about 5,850 lin. yds. of 4-in. British Mannesmann steel pipes, including haulage of pipes from various railway stations, together with the erection of a meter-house, and the provision of all necessary sluice, air, and other valves, washouts, meters, chambers, and incidental works, including the crossing of the tidal river Teign, about one-fourth of a mile in width. Plans may be seen, and copies of the general conditions, specification, bills of quantities, and form of tender obtained, on application at office of Mr. Chas. F. Gettings, engineer, Town Hall, Teignmouth, on payment of a deposit of 5l. Sealed tenders, upon the form supplied, addressed to Mr. A. Percival Dell, Clerk to the Council, Town Hall, Teignmouth, Devon, and endorsed "Teignmouth Water Scheme, Contract No. 2," must be delivered on or before July 7.

JULY 9.—**New Zealand.**—TUNNEL.—Alternative tenders will be received at the office of the High Commissioner for New Zealand, Westminster-chambers, 13, Victoria-street, London, S.W., for the construction of a tunnel, about 5 miles 25 chains in length, at Arthur's Pass, through the dividing range between Canterbury and Westland, on the route of the New Zealand Midland Railway. They are to be addressed to the High Commissioner for New Zealand, 13, Victoria-street, Westminster, S.W., and marked on the outside "Tender for Arthur's Pass Tunnel—sixty months (or forty-eight months)." Tenders will be received up till noon of July 9. Specifications, conditions, tender forms, and other information may be obtained on application to the High Commissioner upon payment of a deposit of 10l.

NO DATE.—**Belfast.**—HOIST.—An estimate for electrifying hoist in the warehouse of Mr. J. N. Richardson, Sons, & Owden, Ltd., Belfast. Application to be made on the premises, where the present hoist can be seen.

NO DATE.—**Lancaster.**—HEATING.—The Visiting Committee of the County Lunatic Asylum, Lancaster, invite tenders for reconstructing and improving the steam heating arrangements and hot-water service of the asylum. Further information may be obtained on application to the Medical Superintendent. Mr. J. T. Cheetham, Clerk and Steward.

NO DATE.—**Wigton.**—WATER MAINS.—The Wigton U.D.C. invite tenders for providing and laying about 3,760 lin. yds. of 6-in. diameter cast-iron piping, with valves, etc., complete, according to plans, sections, and specifications prepared by the Engineer, Mr. Joseph Graham, Bank-chambers, Bank-street, Carlisle. Plans and specifications may be seen at the engineer's office, and bill of quantities obtained, on payment of 1l. 1s.

MISCELLANEOUS.

JUNE 18.—**Barnstaple.**—DESKS, ETC.—Barnstaple Education Committee invite tenders for the supply of desks, cupboards, chairs, etc., for the new schools. Particulars can be obtained from the Secretary, Mr. G. W. F. Brown, The Square, Barnstaple, to whom tenders should be delivered on or before June 18.

JUNE 18.—**Chelmsford.**—OAK FENCING.—The Town Council of Chelmsford invite tenders for supplying and fixing, at their new reservoir at Long Stomps, 70 yds. of oak fencing, 6 ft. high, and for 200 yds. of unclimbable wrought-iron fencing, 4 ft. 6 in. high, the specification for which can be seen at the office of the Borough Surveyor, Mr. Cuthbert Brown, 16, London-road, Chelmsford. Tenders, sealed, and endorsed outside "Fencing for Reservoir," to be sent to Mr. Thos. Dixon, Town Clerk, 16, London-road, Chelmsford, not later than noon on June 18.

JUNE 18.—**Chorley.**—ELECTRIC LIGHT INSTALLATION.—Chorley Corporation invite tenders for the erection of an electric light installation at their Refuse Destructor works, Stump-lane, Chorley. Specification may be obtained on application to Mr. Oswin Hansom, Electrical Engineer, Albert-square, Fleetwood, on payment of 1l. 1s. Tenders, endorsed "Electric Light," to be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, before noon on June 18.

JUNE 18.—**Guildford.**—CARTING.—Guildford R.D.C. invite tenders for carting materials on the various roads in the district. Forms of tender and other information may be obtained of the Surveyor of the Council, Mr. J. Anstee, at the Council's Offices, Commercial-road, Guildford. Sealed tenders, endorsed "Tender for Carting," must be sent to Mr. W. S. V. Cullerne, Clerk, R.D.C. Offices, Commercial-road, Guildford, not later than June 18.

JUNE 18.—**Ilford.**—FURNITURE.—Ilford U.D.C. Education Committee invite tenders for the supply and delivery of 188 dual desks and other furniture at various schools in the district, and for altering 129 infants' desks at the Christ-road-road school. Bill of quantities, form of tender, and other particulars, can be obtained at the offices of the architect, Mr. C. J. Dawson, F.R.I.B.A., 11, Cranbrook-road, Ilford. Tenders, in sealed envelopes, endorsed on outside "Tender for Furniture," to be delivered to Mr. W. S. Torbitt, Secretary to the Committee, Education Offices, Cleveland-road, Ilford, not later than 3 p.m. on June 18.

JUNE 18.—**Swindon.**—ASPHALTING PLAYGROUNDS.—Swindon Corporation invite tenders for asphalting the playgrounds of several schools. Specifications and forms of tender may be had, and further information obtained, from Mr. W. Seaton, Secretary to the Education Committee, Education Office, Town Hall, Swindon, to whom sealed tenders, endorsed "Asphalting Playgrounds," must be sent before noon on June 18.

JUNE 19.—**Chorley.**—FIRE HOSE.—Chorley Corporation invite tenders for supply of 500 yds. of canvas fire hose, 2½ in. diameter. Further particulars may be obtained from Mr. William Cunliffe, Fire Brigade Superintendent, Chorley. Tenders, endorsed "Fire Hose," with sample of hose to be supplied, may be sent to Mr. Jno. Mills, Town Clerk, Town Hall, Chorley, on or before June 19.

JUNE 19.—**Manchester.**—MOTORS, ETC.—Manchester Electricity Committee invite tenders for the supply of the following during the twelve months ending June 30, 1907, viz.:—(*a*) Direct current motors; (*b*) direct current motor starters; (*c*) ampere-hour and watt-hour meters; (*d*) service cables; (*e*) fuse-boxes; (*f*) bitumen; (*g*) box compound. Specifications and forms of tender may be obtained on application to Mr. F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester. Sealed tenders, addressed to the Chairman of the Electricity Committee, must be delivered at the Town Hall not later than noon on June 19.

JUNE 21.—**Belfast.**—FURNITURE, ETC.—Belfast Library and Technical Instruction Committee invite tenders for the following, for the new Municipal Technical Institute, viz.:—(*a*) Furniture and fittings for the School of Art; (*b*) main switch-board; (*c*) machines and appliances for bleaching and dyeing section; (*d*) window blinds; (*e*) folding unal desks. Specifications and drawings relating to the above can be obtained at the Central Technical Institute, College-square North, between 11 a.m. and 5 p.m. For specifications and drawings for (*a*), (*b*), and (*c*) respectively, a charge of 5s. is made; the particulars for (*d*) and (*e*) will be supplied without charge. Payments are not returnable. Sealed tenders, addressed to the "Chairman, Library and Technical Instruction Committee, must be delivered at the Town Hall, Belfast, not later than 11 a.m. on June 21. Each tender to be forwarded in separate cover, suitably endorsed.

* JUNE 21.—**West Ham.**—COAL AND COKE.—The County Borough of West Ham invite tenders for supply of coal and coke to their pumping station, Abbey Mills; the Public Baths, Balaam-street; the Fever Hospital, Plaistow; and other departments within the borough. Forms of tender, etc., may be obtained at the Borough Engineer's office, West Ham, E., upon payment of 1l. Tenders, in the endorsed envelopes supplied with the forms, to Mr. Fred. E. Hilleary, Town Clerk, Town Hall, West Ham, E., before 4, June 21.

JUNE 23.—**Nantwich.**—CARTING.—Nantwich R.D.C. invite tenders for the carting of road material and other team work in connexion with the maintenance and repair of the highways under its jurisdiction for the year ending June 30, 1907. Forms of tender may be obtained on application to Mr. C. E. Speakman, Clerk to the Council, 152, Hospital-street, Nantwich. Further information may be obtained from the Council's Surveyors, Mr. J. R. Whittingham, Stapeley; and Mr. T. J. Peake, Willaston. Tenders to be sent in to the Clerk not later than June 23, marked "Team Labour."

JUNE 25.—**Chorley.**—FURNITURE.—Chorley Education Committee invite tenders for the supply of furniture, etc., for their new Technical and Secondary School, Union-street, Chorley. Specification may be obtained from Mr. John Mills, Town Clerk, Town Hall, Chorley, on payment of 1l. 1s. Tenders, endorsed "School Furniture," to be sent to Town Clerk on or before June 25.

JUNE 25.—**Oxford.**—CARTING.—The Cartage of steam coal from the railway goods station to the works at Hincksey. Forms of tender, and all particulars, can be obtained from the City Engineer, Oxford, to whom sealed tenders are to be delivered on or before June 25.

JUNE 26.—**East Sussex.**—STEAM ROLLER.—East Sussex C.C. invite tenders for the hiring of steam rollers and scarifiers for use upon the main roads during the year ending March 31, 1907. Particulars and form of tender can be obtained on application to Mr. F. J. Wood, Assoc.M.Inst.C.E., County Surveyor, County Hall, Lewes. Tenders, endorsed "Tender for Steam Rolling," to be addressed and delivered to Mr. Wood on or before June 26.

JUNE 26.—**Great Yarmouth.**—CARTAGE, ETC.—Great Yarmouth Town Council invite tenders for the supply of horses, men, harness, carts, and tools for the general cartage and haulage work of the Town Council of Great Yarmouth, for a period of three years. Specifications and forms of tender can be obtained at office of Mr. J. Wm. Cockrill, Borough Surveyor, Town Hall, Great Yarmouth. Tenders, upon the form and in the envelope supplied, are to be delivered at the office of the Town Clerk, Hall Quay, before noon on June 26.

JUNE 26.—**Leyton.**—PULLING DOWN, ETC.—Leyton District Council invite tenders for the pulling down of Knotts Green House, Leyton, E., and clearing the site. Specification, conditions, and Form of tender may be obtained on written application on or before June 20, to Mr. William Jacques, A.R.I.B.A., of 2, Fen-court, Fenchurch-street, E.C., the Committee's Architect. Sealed tenders, in special endorsed envelopes supplied with the forms, must be delivered at the meeting of the Council, to be held on June 26, at 7 o'clock p.m.

JUNE 29.—**Southampton.**—LITHOGRAPHIC STONES.—The Director-General, Ordnance Survey, is prepared to receive applications from any firm which is willing to tender for the supply of lithographic stones. Applications for forms of tender and specification should be made to the Officer in Charge of Stores, Ordnance Survey Office, Southampton. All tenders must be submitted before noon on June 29.

JUNE 30.—**Rotherham.**—CABLE AND METERS.—Rotherham Corporation invite tenders for the supply and delivery of cable and meters, according to their requirements, between August 1, 1906, and July 30, 1907, as follows:—Single vulcanised bitumen (covered) cable of various sizes; electricity meters of sizes for maximum currents of 2½, 5, 10, 25, and 50 amperes. The supply pressure is 230 and 460 volts continuous current. Further particulars can be obtained upon application to the Borough Electrical Engineer. Tenders, endorsed "Tenders for Cable or Meters," to be sent to Mr. W. J. Board, Town Clerk, Town Hall, Rotherham, not later than June 30.

JULY 31.—**Ipswich.**—MATS.—East Suffolk County Education Committee invite tenders for the supply

of 300 iron and 200 fibre mats. Form of tender and conditions of contract (to be returned not later than July 31) may be obtained from Mr. W. E. Watkins, Secretary, White House, Tower Churchyard, Ipswich.

* AUGUST 7.—**Lancaster.**—HEATING.—The Visiting Committee of the County Lunatic Asylum, Lancaster, invite tenders for reconstructing and improving the steam heating arrangements and hot-water service of the above asylum, and will consider tenders from engineers or firms willing to make a survey, free of cost, to the Committee, etc. Further information on application to the Medical Superintendent. Tenders will be received up to August 7.

NO DATE.—**Leeds.**—CONVERSION OF PRIVIES.—Conversion of privies into four water-closets at No. 34, 36, 38, and 40, Fenton-street, Leeds. Estimates required for whole of the work as required by Corporation (except plumbing). Plans and information of Mr. J. C. Bilton, plumber, 4, Chapman's-square, Hyde Park, Leeds.

NO DATE.—**Menai Bridge.**—BRICK TANK.—Tenders are required for the enlargement of a brick tank at the Menai Bridge Works of the Holyhead and North Wales Gas and Water Corporation, Ltd. Full particulars can be obtained, and drawings inspected, at the Chief Offices, Holyhead.

PAINTING, etc.

JUNE 18.—**Kirkheaton.**—COLOURING, ETC.—Kirkheaton Burial Board invite tenders for colouring and cleaning the Cemetery Chapel, Mortuary, and Vestry at Kirkheaton. Particulars may be obtained from, and tenders sent to, Mr. J. Masters, at the Cemetery, or Lynn Burn, Arnold-avenue, Birkby, on or before June 18.

JUNE 19.—**Hull.**—PAINTING.—Hull Education Committee invite tenders for painting externally fifteen of their schools, and for colouring and whitewashing nine others. Particulars and forms of tender can be obtained at offices of Mr. J. T. Riley, Secretary of Education, Education Offices, Albion-street, Hull. Sealed tenders, duly endorsed and addressed to the Secretary of Education, must be delivered not later than 5 p.m. on June 19.

JUNE 20.—**Belfast.**—PAINTING.—Belfast Cemetery and Parks Committee invite tenders for painting at Belfast Cemetery. Specification may be seen in the City Surveyor's office. Sealed tenders, endorsed "Painting at Cemetery," to be lodged in office of Mr. Samuel Black, Town Clerk, before 11 o'clock a.m. on June 20.

JUNE 20.—**Newcastle-on-Tyne.**—PAINTING.—Newcastle-upon-Tyne Markets Committee invite tenders for the cleaning and painting of the Grainger Arcade, Grainger Market. Specifications can be seen, and bill of quantities and form of tender obtained, at the City Property Surveyor's Department, Town Hall. Sealed tenders, addressed to the "Chairman of the Markets Committee," and endorsed "Tender for Painting Grainger Arcade," must be delivered at the Committee Clerk's Office, Town Hall, before 10 a.m. on June 20.

JUNE 21.—**Sunderland.**—PAINTING.—The Council of the County Borough of Sunderland invite tenders for the inside and outside painting, etc., of the following buildings, viz.:—Thomas-street, Chester-road, and Hendon schools; and the Technical College; also the inside painting, etc., of Diamond Hall School and the School of Art; and the outside painting, etc., of Redby, High Barnes, Valley-road, Hudson-road, Moor, and James Williams-street schools. Specifications may be seen, and form of tender obtained, at the Borough Surveyor's office, Town Hall. Sealed tenders, addressed to the "Chairman of the Educational Works Sub-Committee," and endorsed "Tender for Painting, etc., of Educational Buildings," must be delivered at the Town Clerk's Office, Town Hall, before 12 o'clock noon on June 21.

JUNE 23.—**Barrow-in-Furness.**—PAINTING.—The Corporation invite tenders for cleaning, painting, and colouring at the Holker-street, Rawlinson-street, Thwaite-street, and Latona-street schools. Forms of tender and bills of quantities may be obtained at the Borough Engineer's office. Sealed tenders, endorsed "Painting, etc., Schools," to be delivered at the Borough Engineer offices not later than 12 noon on June 23.

JUNE 23.—**Edinburgh.**—PAINTING.—Edinburgh School Board invite estimates for painter work at various schools. Specifications can be obtained at Mr. Carfrae's Office, 3, Queen-street. Estimates, duly marked on outside, must be lodged with the Clerk of the Board, on or before June 23.

JUNE 25.—**Dykebar, Paisley.**—PLUMBER WORK.—The Renfrew District Lunacy Board invite tenders for the execution of the plumber work of the new district asylum at present being erected at Dykebar, near Paisley. Plans may be seen in the office of Mr. T. Graham Abercrombie, Architect, County Place, Paisley; and copies of the specifications and schedules may be obtained from Mr. Ja. Caldwell, jun., Clerk, County-buildings, Paisley, on payment of 2l. 2s. for each schedule. Sealed tenders, marked "Renfrew District Lunacy Board—Tender for Plumber Work," must be lodged with the Clerk not later than June 25.

JUNE 26.—**Ruabon.**—PAINTING.—Denbighshire Education Committee invite tenders for painting and repairs necessary to each of the following Council schools, within the Ruabon Grouped Schools District:—(1) Acrefair Council School, (2) Rhosllanerchrugog Infants' School. Specifications and particulars can be inspected at the offices of Mr. Walter D. Willes, County Architect and Surveyor, 42a, High-street, Wrexham; or at the respective schools. Sealed tenders are to be delivered to Messrs. Evans & Roberts, Secretaries, Education Offices, Ruthin, on or before June 28, endorsed on the outside with the name of the school at which the work is tendered for.

ROADS, SANITARY, AND WATER WORKS.

JUNE 16.—**Devonport.**—LEVELLING, PAVING, ETC.—Devonport Corporation invite tenders for levelling, paving, and completing the following lanes, viz.:—Contract 94, lane between Tamar and Warleigh-avenues; contract 97, lane rear of Nos. 40 to 56, Wilton-street (part of). Plans, specification, and conditions may be seen, and forms of tender and bills of quantities obtained, at the Surveyor's Office, Municipal Offices, 29, Ker-street, Devonport, on payment of 1l. 1s. for each set of quantities. Separate sealed tenders, addressed to Mr. John F. Burns, Borough Surveyor, Municipal Offices, must be delivered on or before 12 noon on June 16.

JUNE 18-19.—**Camberwell.**—ROAD WORKS.—Camberwell Borough Council invite tenders for the following works in Verney-road, Rotherhithe New-road, viz.:—(a) New 12-in. pipe sewer with manholes, gullies, etc.; (b) paving, kerbing, channelling, and making-up road. Specifications and forms of tender can be obtained from Mr. William Oxtoby, Borough Engineer, and tenders must be delivered to the Town Hall, Peckham-road, S.E., for (a) on or before June 19, not later than 6.30 p.m. addressed to the Public Health Committee; and for (b) on or before June 18, not later than 6.30 p.m., addressed to the Works and General Purposes Committee.

JUNE 18.—**Lyme Regis.**—EXCAVATING, ETC.—Messrs. Mitchell, Toms, & Co., Ltd., invite tenders for excavating and levelling the site for new hotel, Lyme Regis. The drawings may be inspected, and bill of quantities obtained, on application at the office of the architect, Mr. Arthur W. Yeomans, F.R.I.B.A., Cornhill, Chard, between the hours of 9 a.m. and 6 p.m. Sealed tenders, on forms supplied, endorsed "Excavating," to be sent to the Secretary, Messrs. Mitchell, Toms, & Co., Ltd., not later than 10 a.m. on June 18.

JUNE 18.—**Lyonshall.**—DRAINAGE.—Lyonshall Parish Council invite tenders for drainage work. Specifications as to material, quantities, etc., can be seen at Mr. J. Ratcliffe's, Lyonshall Nursery. Tenders to be sent in not later than June 18, to Mr. J. Ratcliffe, Clerk, Lyonshall Nursery.

JUNE 18.—**Plymouth.**—ROADS.—Plymouth Corporation invite tenders for making-up and completing the following streets and lanes:—Beckham-place, Bute-road, Pier-street-ope, Ivydale-road-lane West, No. 2, Ivydale-road-lane East, No. 2. Plans and specifications, etc., may be seen at offices of Mr. James Paton, Borough Engineer, Municipal Offices, Plymouth. Sealed tenders must be delivered at the said offices not later than 5 p.m. on June 18.

JUNE 19.—**Cullercoats.**—ROAD WORKS.—Excavating, laying, freestone kerb, rubble foundation, and tar-macadam in Beverley-gardens, Cullercoats, for Tynemouth Corporation. Plans and specification may be seen at the office of Mr. John F. Smillie, Borough Surveyor, to whom sealed and endorsed tenders are to be sent not later than 12 noon on June 19.

JUNE 19.—**Durham.**—TAR PAVING.—Durham County Education Authority invite tenders for all tar paving required to be done at schools in the administrative area of the county. Particulars may be obtained at office of Mr. W. Rushworth, F.R.I.B.A., Architect, County Education Offices, Durham, where sealed, endorsed tenders must be delivered not later than June 19.

JUNE 21.—**Tynemouth.**—PIPE SEWER.—Tynemouth R.D.C. invite tenders for the providing and laying of about 400 lin. yds. 18-in. pipe sewer near Hartley Station, with manholes, etc. Plans may be seen at the office of Mr. A. S. Dinning, 21, Ellison-place, Newcastle-on-Tyne. Tenders to be sent to Mr. A. Whitehorn, solicitor, 60, Saville-street, North Shields, Clerk to the Council, not later than noon, June 21.

JUNE 22.—**Levenshulme.**—STREET WORKS.—Levenshulme U.D.C. invite tenders for sewering, draining, paving, kerbing, flagging, channelling, and completing the following streets and passages in the Council's district:—Carril-grove East extension, Mount-street extension, Derby-street extension, Lonsdale-road, Hawthorn-road, passage rear of Clifford-street, Church-view, etc., passage rear of Rostron and Mercer streets, passage rear of Rostron and Wetherall streets, passages rear of Lonsdale and Hawthorn roads, passage rear of 1 to 13, Cromwell grove, and 17 to 61, Cromwell-grove. Specifications, bills of quantities, and further particulars may be obtained from the Council's Surveyor, Mr. James Jepson, Guardian-chambers, Tiviot Dale, Stockport, on payment of 2l. 2s. Tenders, endorsed "Tender for Private Street Works," to be sealed and delivered to Mr. J. Ogden Hardicker, Clerk to the Council, Northern Assurance-buildings, Albert-square, Manchester, on or before June 22.

JUNE 22.—**Southgate.**—STREET IMPROVEMENTS.—Southgate U.D.C. invite tenders for the execution of certain works of asphalting, tar-paving, kerbing, and channelling of several streets in the Council's district, of a total length of about 2,080 yds. Plans may be seen on application to the Council's Surveyor, Mr. C. G. Lawson, C.E., from whom copies of the specification and forms of tender may be obtained on depositing 2l. in cash. Tenders, endorsed "Footpaths," must reach Mr. W. M. Ellenor, Clerk to the Council, Council Offices, Palmer's-green, N., not later than June 22.

JUNE 23.—**Middlesbrough.**—CEMETERY EXTENSION.—The Cemeteries Committee invite tenders for the construction of about 670 lin. yds. of 15-in. pipe sewer in Ayresome Green-lane, etc., together with manholes, lampholes, and ventilating shafts; also for subsoil draining, laying-out, and constructing tar-asphalt walks, etc., in connexion with the New Cemetery extension. Plans and specifications may be seen, and quantities obtained, at the office of Mr. Frank Baker, C.E., F.G.S., Borough Engineer, Municipal-buildings, Middlesbrough, on payment of 1l. 1s. Sealed tenders, endorsed "Tender for New Cemetery Extension Works," must be delivered at the office of the Town Clerk, Mr. Alfred Sockett, Municipal-buildings, Middlesbrough, not later than 10 a.m., June 23.

JUNE 25.—**Morristown.**—SEWERAGE.—Penarth U.D.C. invite tenders for the construction of tumbling-bays, manholes, flushing tanks, and about 580 lin. yds. of stoneware pipe sewers, varying from 6 in. to 12 in. in diameter. The 12-in. sewer is about 200 lin. yds. long, and will be in tunnel. Plans and specification may be examined, and bills of quantities obtained, on and after June 15, from Mr. Edgar J. Evans, A.M.I.C.E., Surveyor, Council Offices, Penarth. Sealed tenders, endorsed "Sewers," must be delivered not later than noon on June 25.

* JUNE 26.—**West Ham.**—ROAD-MAKING.—The County Borough of West Ham invite tenders for making up various streets, etc. Plans may be seen, and specification, form of tender, etc., obtained, of Mr. John G. Morley, Borough Engineer, Town Hall, West Ham, E., on payment of 1l. Tenders, endorsed "Tender for Private Street Works," to Mr. Fred E. Hilleary, Town Clerk, Town Hall, West Ham, E., before 4, June 26.

* JUNE 27.—**Dartford.**—TAR PAVING, ETC.—The Metropolitan Asylums Board invite tenders for repairing tar paving and other work at Darenth Asylum, Dartford, Kent, and repairing and remaking certain roads at Joyce Green Small-pox Hospital, Dartford, Kent, in accordance with drawings and specification prepared by Mr. W. T. Hatch, Engineer-in-Chief. Drawings, specification, conditions of contract, and form of tender may be inspected at the office of the Board, Embankment, E.C., on and after June 18, and can then be obtained on payment of 1l. Tenders, addressed as noted on the forms, must be delivered at the office of the Board before 10 a.m., June 27.

JUNE 27.—**Edinburgh.**—DRAINAGE.—The Governors of Trinity Hospital, Edinburgh, invite tenders for the several works required in the execution of proposed clean water drains at Trinity Hospital, Blinkbonny Drainage. Schedule of quantities and form of tender, can be obtained on applying to the Burgh Engineer, Police-chambers, who will also exhibit the general conditions, etc. Tenders must be sent to Mr. Thomas Hunter, W.S., Town Clerk, Edinburgh, not later than 10 a.m. on June 27, marked "Tender, Blinkbonny Drainage."

* JUNE 29.—**Walthamstow.**—UNDERGROUND CONVENIENCE.—Tenders are invited for the erection of an underground convenience adjoining the Public Baths, High-street, in accordance with plans and specifications to be inspected at office of the Council's Engineer on and after June 19. Forms of tender can be obtained on deposit of 3l. 3s. Tenders, addressed to Mr. C. Sydney Watson, Town Hall, Walthamstow, and endorsed "Tender for Underground Convenience," to be delivered not later than 5 o'clock, June 29.

JULY 2.—**Clontarf.**—SEWERAGE WORKS.—The Improvements Committee of the Corporation of Dublin invite tenders for the construction of about fourteen miles of pipe sewers, etc. The drawings, specification, bills of quantities, and forms of tender may be inspected at the office of the City Engineer, City Hall, Dublin; and at the office of the Consulting Engineer, Mr. George Chaterton, M.Inst.C.E., 6, The Sanctuary, Westminster, between the hours of 10 a.m. and 5 p.m. daily, Saturdays excepted, and a limited number of copies of the said documents may be obtained at the offices aforesaid on payment of the sum of 5l. 5s. (Crossed cheques only will be received in payment.) Tenders, sealed, and endorsed on the envelope "Tenders for Clontarf Sewerage," must be addressed to the Chairman of the Improvements Committee, City Hall, Dublin, and delivered before 12 o'clock noon on July 2.

JULY 9.—**Tavistock.**—SEWERAGE WORKS.—Tavistock U.D.C. invite tenders for works of sewerage and sewage disposal, including the providing and laying of stoneware and cast-iron sewers, and the construction of sedimentation tanks, manholes, etc., at Tavistock. Drawings may be seen, and copies of the specification, bill of quantities, and form of tender obtained, at the office of the Engineer, Mr. John Chadwick, F.G.S., Bletchley, Bucks, upon payment of a deposit of 3l. 3s. Sealed tenders, on the prescribed forms, endorsed "Tender for Sewage Works," must be received at office of Mr. W. W. Mathews, Clerk to the Council, Council Offices, Tavistock, not later than 12 o'clock noon on July 9.

NO DATE.—**Irthlingborough.**—WIDENING.—Northamptonshire C.C. invite tenders for the widening of the approaches to Irthlingborough Bridge. Names to Mr. C. S. Morris, County Surveyor, County Hall, Northampton.

NO DATE.—**Letchworth.**—ROADS.—Construction of a further group of roads for the First Garden City, Letchworth, Herts. Apply, enclosing 1l. 1s. for specification and bill of quantities, at the Estate Office, Letchworth.

STONE, MATERIALS, AND STORES.

JUNE 18.—**Romford.**—GRANITE SPALLS.—Romford Guardians invite tenders for the supply of 100 tons of blue Guernsey granite spalls, to be delivered at the Workhouse, Romford. Tenders must reach Mr. William Smith, Clerk, North-street, Romford, not later than June 18, and the stone must be delivered within one month after notice of acceptance of tender.

JUNE 20.—**Enfield.**—GRAVEL.—The U.D.C. of Enfield invite tenders for the supply of 750 tons (more or less) of coarse screened Hertfordshire or other approved gravel, delivered free, in such quantities and at such times prior to March 31, 1907, as may be ordered by the Council's Surveyor, at the below-mentioned railway stations in the following quantities (more or less), viz.:—200 tons at New Barnet Station, G.N.R.; 350 tons at Hadley Wood Station, G.N.R.; 200 tons at Potters Bar Station, G.N.R. Tenders (on the forms supplied only) to be sent in to Mr. T. W. Scott, Clerk to the Council, Public Offices, Enfield, endorsed "Tender for Gravel," not later than noon on June 20.

JUNE 20.—**Ormskirk.**—GOODS AND REPAIRS.—The Guardians of the Ormskirk Union invite tenders for the supply of the undermentioned goods and repairs at the Workhouse and Industrial Schools, until June 24, 1907:—(1) Repairs—plumber, glazier, gas-fitter, plasterer, paper-hanger, painter; (2) iron-work; (3) brickwork; (4) joiners' work. Forms of tenders, which will state the approximate quantities required, the nature of the work to be done, and the quality and sorts of the materials to be used, may be obtained on application at office of Mr. Alfred Dickinson, Clerk to the Guardians, Ormskirk. Tenders must be at office of Clerk on or before June 20.

JUNE 20.—**Richmond.**—PORTLAND CEMENT.—The Joint Committee of Management of the Richmond District Asylum invite tenders for the supply of about 700 tons of Portland cement, delivered free, in such quantities as may be ordered, to the Richmond Asylum, Grangegorman, Dublin, and Donabate Station of the Great Northern Railway, for

the Portrane Auxiliary. Copies of the specification can be obtained at the Asylum Offices, Grangegorman, Dublin. Sealed tenders to be sent to Mr. W. J. Murphy, Chief Clerk, Offices, Grangegorman, Dublin, not later than June 20.

JUNE 21.—**Warrington.**—STORES.—Warrington Gas Committee invite tenders for the undermentioned goods. Full particulars can be obtained on application to Mr. W. S. Haddock, Gas Engineer, Warrington. Sealed endorsed tenders to be sent in not later than June 21. (1) Bags; (2) bolts and nuts; (3) brass and copper tubing; (4) brass fittings; (5) builders' ironmongery; (6) cast-iron pipes and connexions; (7) cement; (8) castings; (9) clothing; (10) copper street lamps; (11) cookers; (12) common paving and other bricks; (13) firebricks, fireclay, and retorts; (14) flexible tube; (15) glass; (16) iron and steel; (17) lead and compo pipe; (18) lime; (19) oils, paint, etc.; (20) printing and stationery; (21) rails, crossings, fastens, etc.; (22) red and white lead; (23) setts; (24) timber; (25) wet and dry gas meters; (26) wrought-iron tubes and fittings; (27) coal, slack, or nuts (30,000 tons); (28) cannel (6,000 tons); (29) benzol (7,000 gallons); (30) taps, valves, etc.

JUNE 22.—**Cleckheaton.**—ANNUAL CONTRACTS.—Cleckheaton U.D.C. invites tenders for the following, for the year ending June 30, 1907: No. 2, granite; No. 7, dross, circular kerbs, and setts; No. 12, cartage of coal from railway station to the gas works. Forms of tender, conditions, and full particulars may be had on application at the office of Mr. John H. Linfield, Clerk to the Council, Town Hall, Cleckheaton. Sealed tenders, marked "Tender for ——," to be delivered not later than 4 o'clock p.m. on June 22.

JUNE 23.—**Bedwellty.**—LIMESTONE.—The U.D.C. of Bedwellty invite tenders for the supply and delivery of limestone broken to pass through a 2-in. ring, also limestone screenings, to be delivered, carriage paid, during the months of December, 1906, and January, 1907, at such rate as shall be required by the surveyor, as follows, the quantities being more or less:—150 tons of limestone to Whiterose Station, B. and M. Railway; 50 tons of screenings to Whiterose Station, B. and M. Railway; 150 tons of limestone to Aberbargoed Station, B. and M. Railway; 250 tons of limestone to Pengam Station, B. and M. Railway; 50 tons of screenings to Pengam Station, B. and M. Railway; 350 tons of limestone to Blackwood Station, L. and N.W. Railway; 50 tons of screenings to Blackwood Station, L. and N.W. Railway; 100 tons of limestone to Argoed Station, L. and N.W. Railway; 20 tons of screenings to Argoed Station, L. and N.W. Railway. Sealed tenders, giving price per ton, and endorsed "Tenders for Limestone," to be sent to Mr. T. J. Thomas, Clerk, Bargoed, on or before June 23. Samples to be sent, carriage paid, addressed to Mr. J. H. Lewis, Assoc.M.Inst.C.E., Council Offices, New Tredegar, *viâ* Cardiff.

JUNE 23.—**Newcastle-on-Tyne.**—MATERIALS.—The Guardians of the Poor of the Newcastle-upon-Tyne Union request prices for the following classes of material, which may be required for the workhouse during the ensuing twelve months, viz.:—Sanitary pipes, etc.; builders' hardware, timber, etc.; slates, etc.; sheet lead and piping; and engineers' fittings, pipes, etc. Forms will be supplied by Mr. James Atkinson, Clerk to the Guardians, Union Offices, Pilgrim-street, Newcastle-upon-Tyne. Schedules of prices will be received at office of clerk up to 12 o'clock at noon on June 23.

JUNE 25.—**Leeds.**—ARTICLES.—The Gas Committee of the Leeds Corporation invite tenders for supply of the following articles, for twelve months from date of order:—About 25 tons best merchant iron, at per ton; about 2 tons best charcoal annealed double tinned iron, at per cwt.; about 15 tons wrought-iron grate bars, at per cwt.; about 10 cwt. steel, at per lb.; about 150 gross washers, of various sizes, at per gross; about 3 cwt. wrought nails, at per cwt.; about 10 cwt. cut nails, at per cwt.; about 10 cwt. gas hooks, of various sizes, at per cwt.; about 2½ cwt. pipe hooks, of various sizes, at per cwt.; about 6 tons bolts and nuts, of various sizes; about 5 cwt. iron rivets, at per stone; about 100 boxes tin plates, as per form of tender; about 40 cwt. pure tin ingots, at per lb.; about 90 gross screws, of various sizes, for wood and iron (discount off price list to be stated); about 4 dozen No. 2 square ballast shovels, at per dozen; about 45 dozen No. 7 square coal shovels, at per dozen; about 60 dozen cast steel charging shovels, at per dozen; about 4 dozen coke forks, at per dozen; about 3 dozen spades, at per dozen; about 2 dozen shovel shafts, at per dozen; about 6 dozen pick shafts, at per dozen; about 40 dozen hammer shafts, at per dozen; about 8 dozen hammer heads, of various sizes, at per lb.; about 12 dozen rake heads, at per cwt.; about 8 gross files, of various sizes, and re-cutting files (discount off price list to be stated); about 8 dozen trowels, at per dozen; about 72 dozen galvanised iron buckets, at per dozen; about 80 dozen weed brooms, scavenging, at per dozen; about 100 dozen brushes, of various descriptions (net price); indiarubber goods (net price); wood plugs, ¾ in. to 24 in.; about 25 tons best Spanish virgin pig lead, at per ton; about 80 cwt. virgin sheet lead, at per ton; about 100 tons lead tube, at per ton; about 6 tons genuine white lead, Walker Parker's; about 15 cwt. genuine red lead; about 5 cwt. red oxide paste, at per cwt.; about 14 cwt. black ash; about 30 gal. best pale copal varnish; about 30 gal. oak varnish; about 3,000 gal. black oil; about 1,500 gal. engine oil, at per gallon; about 2,000 gal. gas engine oil; about 300 gal. common oil, at per gallon; about 40 gal. pure boiled linseed oil, at per gallon; about 80 gal. pure raw linseed oil; about 15 cwt. pure turpentine, at per cwt.; about 10 tons cotton waste (coloured) at per cwt; about 7 tons tarred hemp tow gaskin, at per cwt.; about 20 tons Portland cement, at per ton. All articles to be delivered at the stores, Meadow-lane, or at the gasworks, at the price tendered. Samples of the various articles may be seen at the stores office, Meadow-lane, and forms of tender obtained on application to Mr. R. H. Townsley, General Manager, Gas Offices, Leeds. Endorsed tenders, addressed to the Town Clerk, Town Hall, Leeds, to be delivered not later than June 25.

JUNE 26.—**Bromley.**—ROAD MATERIALS.—Bromley Town Council invite tenders for the supply of the following road materials:—3,725 cubic yds. of broken stone, i.e., Guernsey granite, Leicestershire granite, Cherbourg quartzite, Penlee Elvan or Basalt; 250 cubic yds. of broken surface or pit flints; 197 yds. of broken surface or pit flints; 625 cubic yds. of broken surface or pit flints; 740 cubic yds. of broken surface or pit flints; 200 cubic yds. of broken surface of pit flints. Samples of each description tendered for must accompany the tender. Tenders must be made on printed forms, to be obtained at the office of the Borough Engineer, Municipal Offices, Bromley, and must be delivered, addressed to Mr. Fred H. Norman, Town Clerk, Municipal Offices, Bromley, and endorsed "Tender for Road Materials," not later than 3 o'clock p.m. on June 26.

JUNE 26.—**Heywood.**—STORES.—Heywood and Middleton Water Board invite tenders for the supply of stores and materials, including timber, picks, spades, iron, steel, oil, waste, tallow, Portland cement, lias lime, coal, brass taps and fittings, iron pipes, lead service pipes, sluice valves, fire-plug casings, valve casings, and other stores, for a period of twelve months ending June 30, 1907. Specification, form of tender, and all other information may be obtained on application to Mr. James Diggle, C.E., Water Engineer, Water Board Offices, Heywood. Sealed tenders, endorsed as specified, to be sent in to Messrs. G. G. Bourchier & F. Entwistle, Clerks to the Board, Heywood, not later than June 26.

* JUNE 27.—**Barnet.**—GRANITE, GRAVEL, AND HOGGIN.—The Barnet U.D.C. invite tenders for 600 tons and upwards of 2-in. broken granite, 500 tons of gravel, and about 450 tons of Hoggin. The certified crushing strain to be stated, and no forms of tender supplied. Tenders, sealed and endorsed "Granite," "Gravel," or "Hoggin," to Mr. H. W. Poole, Clerk to the U.D.C., 40, High-street, Barnet, on or before June 27.

JUNE 27.—**Ramsgate.**—PORTLAND CEMENT.—Ramsgate Corporation invite tenders for the supply of Portland cement from July 1, 1906, to June 30, 1907, inclusive. The contractor may estimate that the quantity required will not be less than 100 tons, and probably not more than 150 tons. Specification, form of tender, and full particulars may be obtained on application to the Borough Engineer, Albion House, Ramsgate, between the hours of 10 a.m. and 4 p.m. Sealed tenders, endorsed "Tender for Cement," are to be addressed to the "Chairman of the Works Committee," and delivered under cover to the Borough Engineer, Albion House, Ramsgate, on or before noon on June 27.

JUNE 27.—**Ramsgate.**—STONEWARE PIPES.—Ramsgate Corporation invite tenders for the supply and delivery of glazed stoneware pipes, junctions, etc., for the ensuing twelve months. Forms of tender and full particulars can be obtained on application to Mr. T. G. Taylor, Borough Engineer's Office, Albion house, Ramsgate. Tenders, endorsed "Tender for Pipes, etc.," addressed to the "Chairman of the Works Committee," are to be delivered at the Borough Engineer's Office, Albion House, before noon on June 27.

JUNE 30.—**Rotherham.**—STORES.—Rotherham Tramways Department invite tenders for the supply of the following stores and materials required by the Tramways Department during the twelve months ending August 31, 1907:—Oils and grease; tools, hardwood, brake blocks; cast-iron brake blocks; paints and varnishes; brass castings; waste cleaning rags; nuts, bolts, and screws; incandescent lamps; river sand, etc. Forms of tender, specification, and further particulars can be obtained upon application to the tramways Manager, Tram Depôt, Rotherham. Tenders, endorsed "Tramways Stores," to be sent to Mr. W. J. Board, Town Clerk, Town Hall, Rotherham, not later than June 30.

JULY 6.—**Brighton.**—GRANITE SPALLS.—Brighton Corporation invite tenders from such persons as may be willing to enter into a contract for the supply of 1,000 tons of granite spalls. The specification and form of tender may be obtained on application at the office of the Borough Surveyor, at the Town Hall, Brighton. Sealed tenders, addressed to Mr. Hugo Talbot, Town Clerk, Town Hall, Brighton, and endorsed "Tender for Granite Spalls," must be left at the Town Hall before 10 o'clock in the forenoon on July 6.

No DATE.—**Dublin.**—ROAD MATERIALS.—Dublin Paving Committee require supplies of broken Whinstone, fresh-water popple, and fresh-water sand. Full particulars regarding price and specification can be obtained on application at the office of the City Engineer, City Hall, Dublin, during office hours.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*TEMPORARY ASSISTANT	Cheshunt U.D.C.	Not stated	June 1

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*CONTRACTOR'S PLANT, PLYMOUTH—At Outfall Works, West Hoe, Plymouth	Elliott, Ellis, & Co.	June 19
*TIMBER MERCHANT'S, ETC., STOCK—Phœnix Saw Mills, St. Leonard's-road, Poplar	J. Hibbard & Sons	June 19-20
*STOCK OF TOOLS—At 50A, Barbican, E.C.	A. S. Cohen	do.
*FREEHOLD BUILDING LAND, NEW SOUTHGATE—At the Mart	Harman Bros.	June 20
*FREEHOLD ESTATE, ADDINGTON, NEAR CROYDON—At the Mart	Harman Bros.	do.
*FREEHOLD BUILDING PLOTS, HIGH BARNET—Salisbury Arms Hotel, High Barnet	White, Son, & Pill	do.
*FREEHOLD RESIDENCE, ETC., DULWICH PARK—At the Mart	Frank Jolly & James	June 27
*FREEHOLD FARM AND BRICKWORKS, NEWPORT—At The King's Head Hotel, Newport	Parsons & Jolliffe	do.
*FREEHOLD LAND, ETC., ELTHORNE, MIDDLESEX—At the Mart	Edwin Fox & Bousfield	July 2
*FREEHOLD BUILDING LAND, CLAPHAM—At the Mart	Ed. Hugh Henry	July 6
*FREEHOLD PROPERTY, SITTINGBOURNE—At The Bull Hotel, Sittingbourne	Jackson & Sons	July 7
*FREEHOLD ESTATE, GREAT AMWELL, WARE—At Hertford	Norris & Duvall	do.
*BUILDING PLOTS, RUISLIP PARK ESTATE—On the Estate	Ventom, Bull, & Cooper	July 10
*BUILDING SITE, EALING—At the Mart	E. & H. Lumley	July 11
*FREEHOLD BUILDING SITE, CITY OF LONDON—At the Mart	Edwin Fox & Bousfield	July 13
*FREEHOLD BUILDING LAND, ST. LEONARDS-ON-SEA—At the Mart	Daniel Smith, Son, & Oakley	July 20
*FREEHOLD ESTATE, STOKE NEWINGTON—At the Mart	Furbers	

Patents of the Week.

APPLICATIONS PUBLISHED.*

9,909 of 1905.—J. BEWICK: *Kitchen Ranges.*

This relates to means for adjusting and supporting a rising and falling grate front for a kitchen range, and consists of a loose top bar with pivoted front part, this latter having extensions forming pawls, and said top bar carrying the grate front and being at each end formed with a groove, plates by which the top bar and grate front are guided and lugs by which and by the extensions the top bar and front grate are supported at various elevations.

10,255 of 1905.—G. WILSON and W. W. SUER: *Water Heater for Baths and the like.*

This relates to a water heater for baths and the like, and consists of a hollow sheet iron vessel in the form of a Wellington boot which is put in the bath with the narrow or leg part projecting above the surface of the water, the narrow or leg part being open at the top. A suitable gas burner is placed inside the sheet iron vessel which will heat it and the water will thus be heated externally.

10,449 of 1905.—J. H. BRINDLE and S. BONSOR: *Appliance Applicable for use as a Fire Lighter or Stove.*

This relates to a fire lighter or appliance with a chamber or channel—to contain a non-combustible

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

wick and oil or spirit—between two walls and a central passage to admit air to the centre of the flame, and consists in constructing a number of projections upon the edges of the walls or partitions between which air is admitted and the flame allowed to spread.

12,321 of 1905.—E. GOOLD: *Heating Apparatus for Domestic or Warming Purposes.*

This relates to a heating apparatus for domestic or warming purposes especially such as are arranged in separate systems either by a tank or coil within an outer tank, the boiler with circulating pipes and the tank or coil forming the primary system for giving up its heat to the water in the secondary or service system, and has for its object the minimising of the deposit of solids in the boiler. According to this invention both systems are supplied in the first instance from the same cistern. The water in the primary system for heating is used in continual circulation and therefore after it has deposited the solids it originally contained no further deposit can take place, as the make up water for replacing that which may be evaporated is taken from the upper part of the secondary or service tank which has already deposited its solids.

13,797 of 1905.—A. METZ: *Steps or Stairs.*

This relates to the construction of steps or stairs from a composition, and consists in fitting at the front of the step a detachable and replaceable facing strip of metal extending the whole length of the step and forming the nose thereof, said strip being secured or carried upon a supporting plate or upon metal brackets or blocks resting upon the body or foundation of the step, the said composition being run over the whole surface of the step and extending to the top of the said facing strip.

17,229 of 1905.—E. PRICE: *Chimney Cowls.*

This consists of a chimney cowl for the prevention of down draught constructed with notched side plates or wings and a loose shield carried by the wings having side extensions resting on the bottom of the notches which form a fulcrum allowing the shield to turn to either side and close either side of the cowl.

18,006 of 1905.—R. P. WILSON and A. G. MARSHALL: *Ventilating Fans, Blowers, and the like.*

This relates to a fan or blower, so constructed and mounted that its rotation, a gyroscopic processional movement, occurs, whereby the stream of air delivered automatically varies its direction as the fan or blower rotates.

19,297 of 1905.—A. E. BISHOP: *Glass Plates or Tiles, and Means for Attaching the Same to Walls, Ceilings, and other Structures.*

This relates to means for attaching plates or tiles to walls, ceilings, and other structures, and consists in the use in combination and application to the back of said glass plates, tiles, or the like, of a mixture of seven parts of finest ground calcined magnesite, four parts of concentrated sodium silicate solution, three parts pure precipitated silica, and three parts of manganese dioxid. These materials are mixed until a tackey or elastic substance is produced, and then applied to the back of the tile, and while the coating is soft, pottery chips or some such material is sprinkled thereon and pressed into the coating thus forming a key by which the tile can be fixed either with the same mixture that provides the coating or with cements.

20,475 of 1905.—C. JOYNER & CO., LTD., and E. INCHLEY: *Gas Brackets or Fittings.*

This relates to gas brackets or fittings, and consists essentially in the employment of a cut-off plug secured to carry the burner, this plug being located in an upwardly expanded sealing in the front or end connexion piece and of means for rotating the said plug.

26,362 of 1905.—W. SELTNER: *Jiggers for Separating and Grading materials.*

This relates to a jigger having fixed screens and is characterised by the separation or grading being simultaneously effected on two or more screens arranged one above the other in the same chamber of the jigger.

214 of 1906.—C. H. RICHARDSON and G. HUNTER: *Window Sash Suspender.*

This relates to a window sash suspender and consists of a metal casting shaped and cast in one piece and having a hole in its top end for the passage of the sash cord, and a parting bead with a recess to enable the cord to be secured to the sash stile from the face of the sash without removing the sash or beads from the window frame.

10,239 of 1905.—W. T. BUCHLEY: *Drains or like Conduits for Arresting the Passage of Solid Matters in Suspension.*

This relates to drains or like conduits, and consists in the provision of an internal chamber provided with a flat or conical outlet in said base provided with louvred openings, an upstanding flange arranged in the interior of the chamber having perforated or louvred openings, a second fixed base or loose bottom having depending flanges to form a water seal an open topped receptacle adapted to fit into or on to or to rest upon the flange and having louvred openings in its sides level with or arranged at different heights to each other and a grid or cover at the top of the receptacle with or without a fixed flange extending below it all.

13,491 of 1905.—H. J. HASKINS: *Machinery or Apparatus for Scoring, Cutting, Polishing, and Finishing Sanitary Clay Pipes.*

This relates to a valve for finishing clay pipes in which the pipe sockets are when the pipes are slid home on the drum open to access, thereby enabling a scoring tool to be introduced for scoring the interior of the sockets or enabling a cutter or tool to be introduced.

17,465 of 1905.—T. E. DEVONSHIRE and H. STEPHENS: *Pipes more especially intended for use for Conducting Water, or other Fluid under Pressure.*

This relates to pipes used for adjusting water or other fluid under pressure, and consists of a tube made of unperforated metal and of such a form that in cross section it presents a series of dovetails, corrugations or equivalent formations. These may be formed in any suitable way such as by rolling or pressing in thin metal sheet and forming this into the required tube. The cement, mortar, concrete, or the like when moulded inside and outside the metal tube so formed is retained or keyed owing to the formation of the said tube and there is no need to embed any metal rods or rings or expanded metal or the like in the cement, mortar, concrete, and the like within the said metal tube and owing to the longitudinal strength of the said tube when formed there is no necessity to use longitudinal rods embedded in the cement or the like outside the said metal tube, laterally or circumferentially disposed metal rings or spiral metal windings being sufficient to resist the pressure.

16,086 of 1915.—H. J. YATES and D. R. MCNEILL: *Radiator and like Heating Appliances.*

This relates to radiators and like heating appliances, and consists in the combination with a baffle plate or air deflector of a rotatable and resilient clamping device adapted to be inserted and secured in position from the front of the baffle plate.

5,955 of 1905.—H. KLEE: *Method of Manufacturing Artificial Stone Plates or Fibrous Materials and Hydraulic Binding Substances.*

This relates to a method of manufacturing plates from fibrous material and hydraulic binding substances in which a paper, cardboard, or like machine is employed and is characterised by the hydraulic binding substance being supplied to the fibrous material by means of a suitable device, while the fibrous material is still on the perforated drum or on the longitudinal sieve or band of the machine.

9,179 of 1906.—C. SCHMIDT: *Boiler Furnaces for Heating Apparatus and the like.*

This relates to a boiler composed of elements having a feed shaft furnace and consists of an arrangement of louvre-like bars between the boiler elements on the sides of the feed shaft, which bars form one side of inwardly leading passages into which the gases of combustion may enter laterally at various heights.

22,624 of 1905.—A. ABZUG: *Combined Hinges and Fastenings for Doors.*

This relates to a combined hinge and fastening for doors, and consists of a door, opening to right or left, and provided with a cross bar which connects the right and left side rods or hinge pins together, the distinguishing feature being that the cross bar is moved by levers which are so connected with door latches that after the proper side rod has been drawn back the latch can be moved by the upper lever without the cross bar being further influenced.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 31.—By HASLAM & SON (at Reading).

Reading, Berks.—Various enclosures, 62 a. 2 r. 6 p., f. £3,245
Two cottages and 7 a. 2 r. 5 p., f. 540
Two cottages and gdn., f. 220

June 2.—By ELWORTHY & SON (at Wisbech).

Upwell, Cambs.—"The Well Fen Farm," 439 a. 2 r. 37 p., f., p. 11,000

June 6.—By DRYSDALE, NURSE, & CO.

Stamford Hill.—57, Cranwich-rd., u.t. 84 yrs., g.r. 7*l.* 10s., y.r. 45*l.* 455
Clapton.—25, Narford-rd., u.t. 74½ yrs., g.r. 6*l.*, y.r. 34*l.* 350

By RODD & SLIPPER.

Peckham.—28, Camden-gr., f., e.r. 40*l.* 580

By RUSHWORTH & STEVENS.

Caledonian-road.—Bryan-pl., "Bryan Mews" (coach-houses), u.t. 37½ yrs., g.r. 6*l.*, e.r. 31*l.* 210

By WYER, ADAMS, & GLOVER.

Lee.—Grove-pk., "Clovelly," and 1¼ acres, f., p. 2,970

June 7.—By G. F. HARRINGTON.

Beckenham.—Stanley-av., two building sites, 0 a. 3 r. 8 p., f. 460
Overbury-av., two building sites, 0 a. 2 r. 25 p., f. 525

By W. F. LAING.

Stepney.—94, Stepney-green, c., y.r. 28*l.* £185
36, Rectory-sq., u.t. 57¼ yrs., g.r. 4*l.* 10s., y.r 32*l.* 380
Mile End.—2 to 10 (even), Whitehead-st., f., w.r. 94*l.* 18s. 750
7 to 19 (odd), Joseph-st., u.t. 58½ yrs., g.r. 24*l.* 10s., w.r. 188*l.* 10s. 1,025
Poplar.—40, High-st. (s.), f., w.r. 32*l.* 10s. 225

By GODFREY C. LAMBERT.

Streatham.—Julian's Farm-rd., a parcel of freehold building land, p. 3,150

By STIMSON & SONS.

Battersea.—98, 100, and 102, Bridge-rd West, f., w.r. 79*l.* 6s. 770
Putney.—7, Burston-rd., u.t. 48 yrs., g.r. 12*l.* 7s., y.r. 105*l.* 950
Old Kent-road.—Nos. 593, 595, and 597 (s.), area 6,000 ft., f., e.r. 200*l.* 1,600
Canal-gr., a plot of land, area 3,900 ft., f., .. 350
Peckham.—The Retreat, "Arbor Lodge," area 16,800 ft., f., p. 800

By T. B. WESTACOTT.

Kentish Town.—19, Bassett-st., u.t. 34 yrs., g.r. 6*l.*, e.r. 38*l.* 270

June 8.—By J. BAKER, COOKE, & CO.

Mill Hill.—Daws-la., two plots of building land, f. 155
Lawrence-st., three plots of building land, f. 230

By MATTHEWS, MATTHEWS, & CO.

Knockholt, Kent.—London-rd., freehold building land, 0 a. 3 r. 5 p. 630
Wanstead.—Cambridge-pk., "Dunedin," f., e.r. 65*l.* 700

By STANLEY PARKES & BROWN.

Ponder's End.—High-rd., "Garfield House," (s.), f., p. 929
Hornsey.—65 and 67, Middleton-rd., u.t. 61 yrs., g.r. 14*l.* 14s., w.r. 70*l.* 4s. 275
Wood Green.—60 and 62, Winkfield-rd., u.t. 98 yrs., g.r. 13*l.*, w.r. 71*l.* 10s. 420

By VENTOM, BULL, & COOPER.

Alperton, Middx.—Honeypot-la., a corner plot of building land, 2 a. 0 r. 22 p., f. 750
High-st., a plot of building land, 1 a. 1 r. 11 p., f. 875

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY AND SATURDAY, JUNE 15 AND 16.

Incorporated Association of Municipal and County Engineers.—Scottish District Meeting to be held at Berwick-upon-Tweed.

SATURDAY, JUNE 16.

Northern Architectural Association.—Annual excursion, Beverley.

WEDNESDAY, JUNE 20.

Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting of the directors, 8 p.m.

SATURDAY, JUNE 23.

Northern Architectural Association.—Students' Sketching Club excursion.

Edinburgh Architectural Association.—Visit to Gosford House, Longniddry.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	8	0	per 1000 alongside, in river.		
Rough Stocks and Grizzles	1	5	0	,,	,,	,,
Picked Stocks for Facings	2	15	0	,,	delivered.	
Flettons	1	6	0	,,	at railway depôt.	
Red Wire Cuts	1	12	0			
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire	3	15	0	,,	,,	,,
Do. Bullnose	4	0	0	,,	,,	,,
Best Stourbridge Fire Bricks	3	14	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	16	0	0			
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,

BRICKS, &c. (continued).

GLAZED BRICKS (*continued*)—

	£	s.	d.	
Two Sides and one End	15	0	0	per 1000, at railway depôt.
Splays, Chamferred, Squints	14	0	0	„ „ „
Second Quality White and Dipped Salt Glazed	2	0	0	„ less than best.

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered.
Thames Ballast	5	3	„ „
Best Portland Cement	25	0	per ton, „
Best Ground Blue Lias Lime	19	0	„ „

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	„ „
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	„ „
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	„ „

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt.
Beer „	1	6	„ „
Greenshill „	1	10	„ „
Darley Dale in blocks	2	4	„ „
Red Corsehill „	2	2	„ „
Closeburn Red Freestone	2	0	„ „
Red Mansfield „	2	4	„ „
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	„ „
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., „
6 in. rubbed two sides ditto, ditto	2	6	„ „
3 in. sawn two sides slabs (random sizes)	0	11½	„ „
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„ „
1½ in. to 2 in. ditto, ditto	0	6	„ „
HARD YORK—			
Scappled random blocks.	3	0	per ft. cube, „
in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super., „
6 in. rubbed two sides ditto	3	0	„ „
3 in. sawn two sides slabs (random sizes)	1	2	„ „
in. self-faced random flags	0	5	„ „

	s.	d.	
Hopton Wood (Hard Bed) in blocks	2	0	per ft. cube, deld. rly. depôt.
„ „ „ 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
„ „ „ 3 in. sawn both sides random slabs	1	0	„ „
„ „ „ 2 in. do.	0	8½	„ „

SLATES.

In.	In.	£	s.	d.	
20 × 10 best blue Bangor		13	2	6	per 1000 of 1200 at r. d.
20 × 12 „	„	13	17	6	„ „
20 × 10 first quality	„	13	0	0	„ „
20 × 12 „	„	13	15	0	„ „
16 × 8 „	„	7	5	0	„ „
20 × 10 best blue Portmadoc		12	12	6	„ „
16 × 8 „	„	6	12	6	„ „
20 × 10 best Eureka unfading green		15	17	6	„ „
20 × 12 „	„	18	7	6	„ „
18 × 10 „	„	13	5	0	„ „
16 × 8 „	„	10	5	0	„ „
20 × 10 permanent green		11	12	6	„ „
18 × 10 „	„	9	12	6	„ „
16 × 8 „	„	6	12	6	„ „

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt
Hip and Valley tiles	3	7	per doz. „
Best Broseley tiles	50	0	per 1000 „
Do. Ornamental tiles	52	6	„ „
Hip and Valley tiles	4	0	per doz. „
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 „
Do. Ornamental do.	60	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	0	„ „
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 „
Do. Ornamental do.	54	6	„ „
Hip tiles	4	1	per doz. „
Valley tiles	3	8	„ „
Best "Rosemary" brand plain tiles	48	0	per 1000 „
Best Ornamental tiles	50	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	8	„ „
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 „
Do pressed	47	6	„ „
Do. Ornamental do.	50	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	6	„ „

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0

WOOD (continued).

BUILDING WOOD (*continued*)—	At per standard. £	s.	d.	£	s.	d.
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	„ „		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	„		

	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	4	15	0

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ and 3 in. by 7 in.	17	10	0	18	0	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
„ „ 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	10	0	0	11	0	0
Pitch-pine: deals	18	0	0	21	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	„		
Seconds, regular sizes	33	0	0	„		
Yellow Pine oddments	28	0	0	„		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	3	0	0	3	6
Small „ „	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube	0	5	6	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	0	0	9½
¼ in. do. do	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. „ „	0	14	0	0	18	0
¾ in. by 7 in. white „ „	0	10	0	0	11	6
1 in. by 7 in. „ „	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	0	0	7	10	0
Compound Girders, ordinary sections	9	0	0	10	0	0
Steel Compound Stanchions	12	0	0	13	0	0
Angles, Tees, and Channels, ordinary sections	9	0	0	10	0	0
Flitch Plates	9	0	0	10	0	0
Cast Iron Columns and Stanchions including ordinary patterns	7	10	0	8	10	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars"	10	10	0	—		
Mild Steel Bars	8	15	0	9	0	0
Hoop Iron, basis price	9	5	0	9	10	0
„ „ Galvanised	17	0	0	—		
(*And upwards, according to size and gauge.)						
Sheet Iron Black—						
Ordinary sizes to 20 g.	9	10	0	—		
„ „ 24 g.	10	10	0	—		
„ „ 26 g.	12	0	0	—		
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14	0	0	—		
Ordinary sizes to 22 g. and 24 g.	14	10	0	—		
„ „ 26 g.	15	0	0	—		
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	17	0	0	—		
„ „ 22 g. and 24 g.	17	10	0	—		
„ „ 26 g.	19	0	0	—		

METALS (continued).

IRON (*continued*)—	Per ton, in London. £	s.	d.	£	s.	d.
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	14	0	0	...	—	
„ „ 22 g. and 24 g.	14	10	0	...	—	
„ „ 26 g.	15	15	0	...	—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	10	0	...	—	
Best Soft Steel Sheets, 22 g. & 24 g.	12	10	0	...	—	
„ „ „ 26 g.	14	15	0	...	—	
Cut Nails, 3 in. to 6 in.	9	10	0	...	9	15 0
(Under 3 in., usual trade extras.)						

LEAD, &c.	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up.	19	10	0	...	—	
Pipe in coils	20	0	0	...	—	
Soil pipe	22	10	0	...	—	
Compo pipe	22	10	0	...	—	
ZINC—Sheet—						
Vieille Montagne ton	33	0	0	...	—	
Silesian	32	15	0	...	—	
COPPER—						
Strong Sheet per lb.	0	1	0	...	—	
Thin „	0	1	1	...	—	
Copper nails „	0	0	11	...	—	
BRASS—						
Strong Sheet „	0	0	11	...	—	
Thin „	0	1	0	...	—	
TIN—English Ingots „	0	1	10	...	—	
SOLDER—Plumbers' „	0	0	9½	...	—	
Tinmen's „	0	0	11	...	—	
Blowpipe „	0	1	0	...	—	

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft. delivered.
„ fourths	1½d.	„ „
21 oz. thirds	3½d.	„ „
„ fourths	2½d.	„ „
26 oz. thirds	4½d.	„ „
„ fourths	3½d.	„ „
32 oz. thirds	5d.	„ „
„ fourths	4½d.	„ „
Fluted Sheet, 15 oz.	3½d.	„ „
„ 21 oz.	4½d.	„ „

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2d.	per ft. delivered.
¼ „	2½d.	„ „
⅜ „	2½d.	„ „
Figured and Oxford Rolled "Oceanic" Glass, white	4d.	„ „
Do. „ tinted	5½d.	„ „

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	10
„ „ „ in barrels	„	0	1	11
„ „ „ in drums	„	0	2	1
Boiled „ „ in pipes	„	0	2	0
„ „ „ in barrels	„	0	2	1
„ „ „ in drums	„	0	2	3
Turpentine in barrels	„	0	4	1
„ in drums	„	0	4	3
Genuine Ground English White Lead	per ton	22	10	0
Red Lead, Dry	„	21	10	0
Best Linseed Oil Putty	per cwt.	0	7	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TO CORRESPONDENTS.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For constructing a pipe sewer, etc., in Richmond-hill-road, for the Town Council. Mr. William Dyack, Borough Surveyor, 41½, Union-street, Aberdeen:—

Gall & Walker, Richmond-street £51 13 10

ALFORD (Lincs).—For erecting a house, for the Urban District Council:—

C. R. Seymour, Alford..... £185

ALDERSHOT.—For street works, York-road and St. George's-road, for the Urban District Council. Mr. F. C. Uren, Surveyor to the Council. Quantities by Surveyor:—

	York-road.	St. George's-road.
W. Norris, Upper Hale, near Farnham, Surrey.	£745 10 6	.... £148 10 0

AMERSHAM (Bucks).—For the erection of a shop and premises, Station-road, for Mr. J. T. Toovey. For Mr. E. T. Gilder, architect, 100A, High-street Watford:—

G. Darlington ..	£1,100 0	C. H. Hunt & Son	£701 0
R. J. Wright ..	980 0	A. E. & C. Saw* ..	692 10
B. Stone & Son	845 0		

ASHBY (Lincolnshire).—For erecting a new Wesleyan Church. Mr. W. H. Buttrick, architect, 28, Wells-street, Scunthorpe:—

A. & H. Woods	£4,095 0 0	S.R.&T.Kelsey,	
Good & Son ..	3,992 8 3	Goole	£3,793 0 0
Scarborough ..	3,890 0 0		

BOLTON-LE-SANDS (Lancaster).—For constructing a 9-in. iron and earthenware pipe sewer, for the Lancaster Rural District Council. Mr. W. Dixon, Surveyor, 5, Dalton-square, Lancaster:—

A. Long, Bolton-le-Sands, near Camforth £160 12 6

BUSHEY.—For erecting new elementary school and cookery centre, London-road, for the Education Committee of Hertfordshire County Council. Mr. Urban A. Smith, County Surveyor, Hatfield:—

J. Willmott & Sons	£13,483 9 8	C. Brightman	11,449 3 8
Wilkinson Bros.	13,300 0 0	J. & M. Patrick	11,332 0 0
W. Bailey & Son*	12,396 1 1	F. & G. Foster	11,027 0 0
L. & W. H. Patman ..	12,285 0 0	H. Flint	11,026 0 0
Mattock & Parsons ..	12,272 0 0	Oak Building Co.	10,899 0 0
A. W. Nash	12,171 9 9	Kettering Co-operative Builders, Ltd.....	10,467 1 1
W. S. Shepherd & Co.	11,745 0 0	T. Cuthbert	10,419 3 6
W. H. Hyde	11,679 0 0	G. Henson & Son, Midland-road, Wellingboro'*	10,348 11 1
C. Miskin & Sons	11,586 0 0	Hooper, Neary, & Co.	9,939 3 11
G. & F. Waterman	11,544 0 0		
Coulson & Lofts	11,475 0 0		

COLCHESTER.—For erecting the East Ward Council school, Greenstead-road, for the Education Committee. Messrs. Goodey & Cressall, architects, Victoria-chambers, Colchester:—

Spencer, Santo, & Co.	£10,400 0	Young & Son ..	£9,267 0
Coulson & Lofts	10,180 0	R. Beaumont ..	9,134 17
Oak Building Co.	9,973 0	Everett & Son ..	8,998 0
J. McKay	9,479 0	C. Roper	8,700 0
W. Chambers..	9,439 0	Dobson & Son ..	8,679 0
H. W. Gladwell	9,374 0	T. J. Ward, Colchester*.....	8,600 0
H. E. Ambrose	9,296 0	Clark & Sons ..	8,297 0

CONVOY (Ireland).—For erecting four dwelling-houses, for Mr. S. Ashe. Mr. J. M'Intyre, architect, Letterkenny:—

A. Neely.....	£648 0 0	J. Johnstoun ..	£550 0 0
Smyth Bros. ..	645 6 10	E. Baily	544 0 0
S. Donnell	615 0 0	G. Kelly, Convoy*	525 0 0
W. Flat	610 0 0		
J. M'Grath....	551 0 0		

CRAWLEY.—For the construction of about 7,784 yds. of earthenware pipe sewers, ranging from 7 in. to 15 in., with the necessary tanks, pumping station, engines and pumps, percolating filters, and the laying-out of a sewage irrigation area and other works, in the parishes of Crawley and Ifield, Sussex, for Horsham Rural District Council. Mr. S. R. Lowcock, engineer:—

Edwards & Co., Granville House, Arundel-street, Strand* £10,750 3 5

CROYDON.—For the erection of small first-floor additions to the workhops at the Workhouse, Queen's-road, for the Guardians. Mr. H. Berney, architect, 104, George-street, Croydon:—

E. P. Bulled & Co., Strathmore-road, Croydon* £269

CRAWLEY.—For Crawley and Ifield sewerage and sewage disposal works, for the Horsham Rural District Council. Mr. Sidney R. Lowcock, M.Inst.C.E., Engineer for the works, Westminster:—

J. H. Macdonald	£15,511 6 6
Smith & Co.	13,862 17 2
J. & T. Binns	13,656 15 0
F. W. Trimm.....	13,651 0 0
F. Osenton.....	13,637 19 5
E. Potterton	13,595 0 0
A. N. Coles.....	13,522 5 0
J. Jackson	13,497 15 0
R. C. Brebner & Co.....	13,420 0 0
G. Napier & Sons	13,384 19 10
J. A. Ewart	13,216 14 0
Rowland Bros.	13,210 0 0
Johnson & Langley	13,141 0 0
B. Wilkinson	13,139 0 0
G. Bell & Sons	12,891 0 0
R. Cooke & Sons	12,818 0 0
E. Iles, jun.	12,659 0 0
W. Pearce	12,584 5 0
R. Easton	12,542 0 0
Hooper, Neary, & Co.	12,484 11 3
Pethick Bros.....	12,219 0 0
G. G. Rayner.....	11,999 3 2
Hewett & Sons	11,934 18 9
W. Smith	11,907 3 4
R. H. B. Neal	11,707 0 0
W. L. Wallis & Co.	11,500 0 0
H. Brown	11,343 0 0
Edwards & Co., Strand, W.C.* ..	10,750 3 5

[Engineer's estimate, £11,611 4s. 2d.]

EAST BARNET.—For additions and alterations to the Margaret-road County Council School, for the Hertfordshire County Council Education Committee. Mr. Urban A. Smith, County Surveyor, Hatfield:—

Coulson & Lofts	£2 186 0 0
W. M. Butcher	2,123 3 4
Patman & Fotheringham, Ltd. ..	2,073 0 0
J. & M. Patrick	2,055 0 0
J. Willmott & Sons	2,042 17 11
A. Fairhead & Sons	2,029 0 0
L. & W. H. Patman	1,999 0 0
Mattock & Parsons	1,971 0 0
J. Stewart	1,958 0 0
J. Thomas	1,952 0 0
W. H. Hyde.....	1,945 10 0
F. W. Harris & Co.....	1,877 0 0
F. & G. Foster.....	1,842 0 0
Wilkinson Bros.	1,841 0 0
H. Flint	1,833 0 0
Kettering Co-operative Builders, Ltd., Kettering*	1,714 11 2

EAST GRINSTEAD.—For laying pumping main and sewers, for the Urban District Council. Mr. W. E. Woollam, Engineer and Surveyor, Council Offices, East Grinstead:—

Collingwood & Co. ..	£800	Johnson	£597
C. Rice	755	Reade & Sons	568
I. Waters & Sons	749	G. Wells	517
E. & E. Iles	727	G. G. Rayner, Croydon	500
G. Bell & Sons	639		

EAST GRINSTEAD.—For building engine-house, tanks, etc., for the Urban District Council. Mr. W. E. Woollam, Engineer and Surveyor, Council Offices, East Grinstead:—

C. Rice.....	£603	G. Wells	£490
E. & E. Iles	576	Reade & Sons, Bridge-street, Westminster	456
I. Waters & Sons....	498		

EAST GRINSTEAD.—For 1,400 yds. of 6-in. cast-iron socket pipes, for the Urban District Council. Mr. W. E. Woollam, Engineer and surveyor, Council House, London-road, East Grinstead:—

	Per ton.		Per ton.
J. Every	£6 7 6	J. & R. Ritchie ..	£5 7 6
Yarrow & Co.	6 5 0	Seal, Austen, & Barnes	5 7 0
Weeks & Son	6 2 6	Case & Barnes....	5 6 6
Cochrane & Co. ..	6 0 0	Holwell Iron Co...	5 5 0
A. E. Cloake	5 19 0	Sheepbridge Coal and Iron Co.....	5 3 0
A. & C. Bridgland, Ltd	5 15 0	Staveley Coal and Iron Co., near Chesterfield	5 2 6
Birtley Iron Co. ..	5 11 6		
Rice Bros.	5 11 3		
Stanton Iron Co...	5 8 6		
Cochrane & Co. ..	5 7 6		

EAST GRINSTEAD.—For supplying and erecting duplicate gas-engines and pumps, for the Urban District Council. Mr. W. E. Woollam, Engineer and Surveyor, Council Offices, East Grinstead:—

G. R. Mather	£1,400 0 0!	Rice Bros, Ltd.	£575 7 6
A. C. Potter & Co.	744 0 0	G. Waller & Son	568 0 0
Pratchitt Bros.	698 0 0	National Gas Engine Co. ..	565 0 0
Tangyes, Ltd.	643 0 0	Rice Bros.	533 12 6
R. Proctor ..	633 0 0	Weeks	514 0 0
Lee, Howl, & Co.	623 0 0	Crossley Bros., Ltd.	500 0 0
Hayward, Tyler, & Co., Ltd.	591 13 0	Campbell Gas Engine Co., Halifax.....	485 0 0!
F. Bird & Co.	583 0 0		

EVESHAM.—For erecting a jam factory, for Messrs. T. W. Beach & Sons. Mr. F. Foster, architect, Masonic-buildings, Coventry:—

C. H. Haywood..	£9,184 0	R. Bowen	£8,390 0
W. J. Bloxham ..	9,130 0	J. Darse	8,350 0
A. J. Colborne ..	8,999 9	Cliff & Co.	8,318 0
E. R. Dyke	8,912 0	Esply & Co., Ltd.	8,200 0
T. Broad, Ltd. ..	8,891 0	W. Lissaman & Co.	8,100 0
G. Huins & Son ..	8,792 0	R. P. Gathercole	7,900 0
W. Jones	8,745 0	W. H. Gibbs	7,878 0
T. Bailey	8,700 0	E. Harris, Coventry*.....	7,852 0
J. Parnell & Son	8,690 0		
J. E. White	8,475 0		

GREAT MISSENDEN (Bucks).—For the erection of an artist's studio at "The Brow," for Mr. Julian Phillips. Mr. J. Bruce Merson, architect, 76, High-road, Kilburn, N.W.:—

F. G. Rust	£512 0	G. Parsons, Prestwood*	£440 0
Aldridge & Son ..	492 0	H. J. Wright	365 10
G. Darlington	472 0		

GRIMSBY.—For erecting new hall, Garibaldi-street, for the Ancient Order of Foresters. Mr. H. Heap, architect, Osborne-chambers, Grimsby:—

W. Kuson*..... £1,123

HARROGATE.—For private street works required in a portion of Lancaster Park-road, for the Corporation. Mr. F. Bagshaw, Borough Engineer and Surveyor, Harrogate:—

E. Long, 7, Forest-avenue, Starbeck, Harrowgate* £468 5 7

HEBBURN.—For excavating and laying tar macadam roadways, whinstone paving, etc., in Hedgeley-road, etc., for the Urban District Council. Mr. H. Paterson, Surveyor, Council Offices, Argyle-street, Hebburn:—

A. Walker & Son	£2,885 8 6	T. Callagham	£2,273 16 6
Glen & Moffett	2,577 17 7	H. Paterson..	2,235 14 6
G. Thornton & Co.....	2,495 17 6	J. Wardlaw ..	2,234 7 0
W. Kennedy..	2,393 10 0	J. Hollings ..	2,183 5 3
J. R. Smiles ..	2,355 15 3	J. Hadfield & Co., Park-lane, Sunderland*	2,150 7 3
H. Ellison....	2,328 11 0		

[Surveyor's estimate, £2,235 14s. 6d.]

HESTON.—For main road paving, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Engineer and Surveyor, Council House, Hounslow, W.:—

A. Walker & Son, Ltd.	£4,143 3 2
G. Wimpey & Co.	3,472 13 9
T. Adams.....	3,425 10 0
S. Gibbons	3,359 11 9
G. R. Mann	3,336 13 6
M. Thacker & Co.	3,335 1 3
W. Griffiths & Co.	3,327 1 11
Langley & Johnson	3,289 9 4
W. Neave & Son	3,280 0 0
Patent Victoria Stone Co., Ltd. ..	3,276 8 5
T. Free & Son	3,273 17 0
T. Watson, Jun.	3,271 5 2
E. Rogers & Co.	3,253 8 11
T. Chapman.....	3,238 2 3
E. & E. Iles	3,192 4 9
J. Mowlen & Co., Ltd., Westminster*	3,167 0 0
S. Atkins & Co.‡	2,325 8 3

‡ Error in tender.

HORWICH.—For sludge pressing and other plant required at Sewage Disposal Works, for the Urban District Council. Mr. H. L. Hinnell, engineer, 41, Corporation-street, Manchester:—

Ashton, Frost, & Co.	£1,495 0
Manlove, Alliott, & Co., Ltd.	1,467 10
Whitehead & Poole	1,168 7
J. Wolstenholme & Son	1,108 0
Goddard, Massey, & Warner, Nottingham*	1,125 10

LLANBERIS.—For rebuilding and altering building, for Mr. William Williams, Plas Coch, Llanberis. Mr. Llewelyn Lloyd Jones, architect and surveyor, Tower-buildings, Carnavon:—

O. Morris.....	£335 0	T. P. Roberts & Son	£188 0
Jones Bros.....	240 0	H. Jones, Llanberis*	168 12
S. O. Roberts	239 0		
J. Jones & Son ..	230 0		

LONDON.—For the internal painting, etc., at the infirmary, Brook-street, for Lambeth Guardians:—

A. F. Vigor & Co.	£510 0 0	Cracknell & Co.	£348 0 0
W. Hussey	508 10 0	J. J. Richards, senr.	331 15 0
Greenhill & Markham	505 10 0	Rice & Son	313 0 0
Wright & Co. ..	502 10 0	A. H. Inns	298 10 0
W. Dennison ..	499 0 0	E. Mills.....	285 0 0
F. Barr	486 0 0	Loasby & Salmon	279 0 0
Warburton & Son	465 0 0	H. Kent, 31, Beacon-road Hither-green, S.E.*.....	274 0 0
J. J. Richards..	373 10 0		
J. S. Fenn	359 0 0		
H. Bragg & Sons	351 2 8		

LONDON.—For cleaning and painting works at the Northern Convalescent Fever Hospital, Winchmore Hill, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

E. Mills.....	£2,476 14 0	M. McCarthy ..	£1,500 0
Chappell & Co.	2,421 13 5	F. W. Harris & Co., Ltd.	1,500 0
P. McCarthy..	2,007 0 0	E. Proctor & Son	1,425 0
W. Dudley ..	1,903 5 0	R. Woollaston & Co., 40, Turners-road.	
A. H. Inns ..	1,830 0 0	Limehouse, E.*	1,350 0
W. J. Simms & Sons	1,728 0 0		
W. Hussey ..	1,544 17 0		

LONDON.—For hot-water heating apparatus in the lower Administration Block at South Western Hospital, Landor-road, Stockwell, S.W., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

R. J. Ward Co.	£225 0 0
Taylor & Fraser	218 0 0
J. Keith & Blackman Co., Ltd.	215 0 0
J. Weeks & Co., Ltd.	210 0 0
H. & C. Davis & Co., Ltd.	209 0 0
R. Dawson & Co., Ltd.	197 0 0
W. J. Burroughes & Sons	197 0 0
P. H. Allin & Sons, Ltd.....	192 10 0
Death & Ellwood.....	182 12 0
Dargue, Griffiths, & Co., Ltd.	180 10 0
Bolton, Fane, & Co.	177 0 0
Matthews & Yates, Ltd.....	175 0 0
J. Gray	165 0 0
W. G. Cannon & Sons, Ltd.	165 0 0
South-Eastern Engineering Co.....	159 0 0
J. & F. May	159 0 0
M. Duffield & Sons, Ltd.....	158 0 0
R. Harding & Son	155 0 0
G. Hopkins & Sons	154 6 6
Brightside Foundry & Engineering Co., Ltd.	149 0 0
T. Potter & Sons, Ltd.	137 19 0
W. Freer	127 0 0
H. T. Wright Bros. Ltd.	125 9 0
H. J. Cash & Co., Ltd.	122 0 0
G. & E. Bradley	113 0 0
Cannon & Hefford, Stanbury Works, Stanbury-road, Peckham*	112 0 0

LONDON.—For the erection of four cottages at Ordnance-road, East Greenwich, for Mrs. S. R. Colwell. Mr. Alfred Roberts, architect, Greenwich, S.E.:—

Thomas & Edge ..	£1,587	W. J. Howie	£1,194
F. & T. Thorne....	1,467	H. Groves, Stockwell-street, Greenwich*	1,150
T. D. Leng.....	1,360		
W. Martin	1,216		

LONDON.—For the erection of residence, "Moulmain," in the Grove, Church End, Finchley, N., for Mr. R. J. Bailey. Messrs. Bennett & Richardson, architects, 2, The Broadway, Finchley:—

Jackson	£800	Nicholls & Son*	£697
C. W. Scott	800		

LONDON.—For the erection of residence, "Westfield," in Hendon-avenue, Finchley, N., for Mr. J. B. West. Messrs. Bennett & Richardson, architects, 2, The Broadway, Finchley, N. Quantities by the architects:—

W. Tout	£2,262	F. Gough & Co	£2,164
Nicholls & Son	2,250	Patman & Fotheringham, Ltd.	2,153
Ford & Walton, Ltd.	2,235	Sheffield Bros.	2,045
Godson & Son	2,233	W. Lawrence & Son*	1,997
Mattock Bros.	2,193		
C. W. Scott	2,166		

LONDON.—For the first section of exterior restorations of the west and south facades of St. Stephen's Church, Eltborne-road, Upper Holloway. Mr. G. Carter, architect, 513, Holloway-road, N.

E. Tomkins, 152, St. John's-road, N.* £500

LONDON.—For alterations to No. 494, Hornsey-road, for Mr. Churley. Mr. G. Carter, architect, 513, Holloway-road, N.:—

Rowe	£151 0	G. Cox, Holloway-road*	£148 15

LUDLOW.—For the execution of drainage works at the Workhouse, for the Guardians. Mr. B. Weale, architect, East Hamlet, Ludlow:—

T. Speake, Church Stretton £497

LUDLOW.—For the extension of the infirmary at the Union Workhouse, for the Guardians. Mr. B. Weale, architect, East Hamlet, Ludlow:—

T. Speake, Church Stretton £533

MORRISTON.—For "Libanus" new schoolroom. Mr. C. S. Thomas, architect and surveyor, Wind-street, Swansea:—

J. & D. Jones	£1,310 0 0	G. Davies	£1,217 10 6
T. Richards	1,280 0 0	Walters & Johns	1,211 9 0
D. Jenkins Exors.	1,258 10 0	T. D. Jones	1,177 11 0
Bennett Bros.	1,250 0 0	J. Walters	1,160 0 0
Lloyd Bros.	1,243 10 0	Thomas & Jones, Morriston*	1,082 0 0
J. & F. Weaver	1,225 0 0		
Williams & Mort	1,220 0 0		

ST. ALBANS.—For additions and alterations to the Priory Park County Council School, for the Education Committee of Hertfordshire County Council. Mr. Urban A. Smith, County Surveyor, Hatfield:—

Bailey & Sons	£1,533 8 11	E. Brown & Son	£1,330 0 0
G. E. Wallis & Sons	1,499 0 0	F. & G. Foster	1,296 0 0
E. Dunham	1,428 6 6	W. H. Hyde	1,274 0 0
J. Willmott & Sons	1,404 11 10	Kettering Co-operative Builders, Ltd.	1,256 9 0
C. Miskin & Sons	1,383 0 0	T. Cuthbert, Hyson-green, Nottingham*	1,242 5 0
H. Flint	1,366 0 0		
J. & W. Drake	1,349 0 0		

ST. ALBANS.—For additions and alterations to the Garden Field's County Council School, for Hertfordshire County Council. Mr. U. A. Smith, County Surveyor, Hatfield:—

W. Payne	£2,497 8 4	F. & G. Foster	£2,187 0 0
F. J. Bailey	2,495 0 0	J. T. Bushell	2,175 0 0
F. W. Stanley	2,481 0 6	C. W. Dumpleton	2,162 0 0
Gibson & Co.	2,354 0 0	W. W. Hyde, Clifford-road, Norwood Junction	2,038 0 0
W. Irwin	2,297 0 0		
H. A. Williamson	2,234 13 5		
Miskin & Sons	2,199 0 0		

ST. BREWARD (Cornwall).—For trenching and laying 9-in. diameter cast-iron and stoneware pipes from Stannon to near Wenford Bridge, for the Directors of the North Cornwall China Clay Company, Ltd. Mr. T. B. Andrew, engineer, Market-hill, St. Austell:—

White & Alderman	£5,129 0	W. E. Bennett	£2,640 0
Runnalls & Son	2,896 0	J. Colliver	2,624 12
Woodman & Son	2,780 0	Steer & Pearce, Plymouth*	2,409 0
C. E. Carden	2,773 16		

SHILLINGTON (Beds).—For erecting a chapel, for Primitive Methodist Church Committee. Mr. J. Shilcock, architect, Hitchin:—

M. Foster & Co.	£575 0	A. Ellis	£400 0
A. C. Bland	474 0	King & Peck	400 0
J. S. Launder	456 0	W. Pearmain	387 0
Hedgecock & Brewer	435 0	A. B. N. Bridges	350 0
Young & Co.	415 15	C. F. Sherren	347 0

SNODLAND.—For building a mortuary at the cemetery, for the Parish Council. Mr. Charles Souter, jr., architect:—

A. G. Candler	£204	E. Norman	£135
G. Gates	145	R. T. Langridge, Hamhill, Snodland*	127
J. A. Davison	143		
E. G. Brown	142		

SURBITON.—For private street works at Ravenscar-road and Crane's-drive, for the Urban District Council. Mr. H. T. Mather, Surveyor, District Council Offices, Surbiton:—

G. Napier & Sons	£2,186 0 0	E. & E. Iles	£1,816 13 9
James & Heburn	1,849 0 0	S. Kavanagh & Co.	1,782 7 3
T. Free & Sons	1,835 0 0	J. Mowlem & Co., Westminster*	1,767 0 0
S. Atkins	1,829 0 0		

SWINDON.—For making additions to the Whale Inn, for Messrs. Wadley & Co. Messrs. Drew & Sons, architects, Regent-circus, Swindon:—

S. Ogbourne	£730 0	Tydeman Bros., Swindon*	£648 8 7
P. Chick	725 0		
H. & C. Spackman	678 0		

TOTNES.—For the construction of sewerage works, for the Urban District Council. Mr. C. E. Ware, engineer, 18, Bedford-circus, Exeter:—

W. C. Shaddock	£12,713 13 4
G. Pollard & Co.	11,763 16 10
T. Shaddock	11,693 0 0
J. Shaddock	11,506 13 6
A. N. Coles	9,871 16 11
E. R. Lester	9,732 0 0
Matcham & Co., Ltd.	9,498 0 0
R. H. B. Neal, Ltd.	9,264 0 0
E. Pike	9,222 0 0
Pethick Bros.	9,209 0 0
R. E. Narracott	8,417 6 8
Woodman & Son	8,269 0 0
Stephens & Sons, Ltd.	7,733 0 0
E. Harris, Clyst Hydon, Exeter*	7,625 0 0

TREDEGAR (Mon.).—For erecting a house and shop at Tredegar Junction:—

H. Rees, Blackwood* £595

WESTERHOPE.—For erecting a new Council school at Westerhope, near Newcastle-on-Tyne, for Northumberland County Council Education Committee. Mr. G. Topham Forrest, Architect to the Education Committee. Quantities by Messrs. J. P. Allen & Partners, Newcastle-on-Tyne:—

S. Eastew, Ltd., Newcastle-on-Tyne* .. £4,100

WREXHAM.—For laying 209 yds. of stoneware sewer in Watery-road, and for manholes, etc., for the Town Council. Mr. J. England, Borough Engineer, Wrexham:—

H. A. Jones	£289 3 6	R. Williams	£231 16 6
Davies Bros.	253 0 0	J. Stephens*	225 3 5

[All of Wrexham.]

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